Mathematica®
Progress Together

Independent Evaluation of Comprehensive Primary Care Plus (CPC+):

Fourth Annual Report

MAY 2022

This page has been left blank for double-sided copying.

Independent Evaluation of Comprehensive Primary Care Plus (CPC+)

Fourth Annual Report Appendices

May 2022

Lead authors:

Jessica Laird
Amanda Markovitz
Jelena Zurovac
Pragya Singh
Dana Petersen
Priya Shanmugam
Nikkilyn Morrison
Brianna Sullivan
Rosalind Keith
Shannon Heitkamp
Kaylyn Swankoski
Elizabeth Holland
Carol Urato
Ha Tu
Ann O'Malley
Eunhae Shin
Jacob Vogler
Arkadipta Ghosh
Lauren Johnson
Kristin Geonnotti
Victoria Peebles
Laurie Felland
Melanie Au
Ning Fu
Irina Degtiar
Genna Cohen
Mynti Hossain
Ellen Bouchery
Min-Young Kim
Lianlian Li
Diane Rittenhouse
Mariel Finucane
Tessa Huffman
Sean Orzol
Stacy Dale
Tim Lake
Kristie Liao
Erin Lipman
Deborah Peikes
Jonathan Brown
John Schurrer
Sam Lau
Joey Lovins
Laura Blue
Randall Brown
Nancy McCall

Contributing authors (in alphabetical order):

Mattan Alalouf
Priya Bajaj
Christine Cheu
Jared Coopersmith
Eric Dehus
John Deke
Kathryn Dewitt
Nancy Duda
Sheena Flowers
Jonathan Gellar
Cindy George
Sabitha Gopalsamy
Gillian Giudice
Sheila Hoag
Neetu Jain
Rachel Machta
Caroline Mack
Andrew McGuirk
Maya Palakal
Christopher Palo
Christina Papirnik
Rhea Powell
Carol Razafindrakoto
Eugene Rich
Michelle Roozeboom-Baker
Mike Rudacille
Rumin Sarwar
Nekabari Sigalo
Christina Sintek
Asta Sorensen
Xiaofan Sun
Ana Talamas
Dan Thal
Lori Timmins
Beny Wu
Cristobal Yanez Tandeciarz

Submitted to:

U.S. Department of Health and Human Services
Center for Medicare & Medicaid Innovation
7500 Security Blvd.
Baltimore, MD 21244-1850
Project Officer: Timothy Day
Contract number: HHSM-500-2014-00034I/ HHSM-500-T0010

Submitted by:

Mathematica
P.O. Box 2393
Princeton, NJ 08543-2393
Telephone: (609) 799-3535
Facsimile: (609) 799-0005
Project Director and Principal Investigator: Nancy McCall
Deputy Project Directors: Nancy Duda and Kaylyn Swankoski
Co-Principal Investigators: Stacy Dale and Ann O'Malley
Reference Number: 50319

This page has been left blank for double-sided copying.

Contents

Tables

Figures

This page has been left blank for double-sided copying.

APPENDIX 2

2.A. 2018 Starter participation

In the 4 regions that began CPC+ in 2018, CMS has partnered with 8 private and public payers and 9 health IT vendors to support the efforts of 168 primary care practices to achieve the Comprehensive Primary Care Functions. Like the cohort that started CPC+ in 2017, the cohort that started in 2018 has shown fairly steady participation over the first three program years. By the end of Program Year (PY) 3, CMS was partnering with 8 payers and 8 vendors to support 153 primary care practices serving nearly 1.2 million patients (Figure 2.A.1). Overall, there has been a 7 and 5 percent decrease in the number of practices and practitioners participating, respectively, but a 4 percent increase for patients. The same number of payer partners and health IT vendors have partnered with this cohort since the start of CPC+.

Figure 2.A.1. Stakeholders involved in CPC+ in PY 1 through PY 3, 2018 Starters

	Payers[a]	Practices	Practitioners	Patients[b]	Health IT vendors[c]
Start of PY 1	16	165	1,135	1.1M	8
End of PY 2	16	156	1,100	1.3M	8
End of PY 3	16	153	1,080	1.2M	8
Change from PY 1	-0%	-7%	-5%	+4%	-0%

Source: Mathematica's analysis of PY 1, PY 2, and PY 3 CPC+ practice, payer, and health IT tracking data provided by CMS; practice-reported financial data; and CMS Medicare FFS attribution data.

[a] Payer partners that operate in more than one region are counted separately for each region in which they partner.

[b] The patient count for PY 1 reflects the number of patients served by CPC+ practices at the end of the first program year.

[c] Health IT vendor counts include vendors who formed partnerships with Track 2 practices. The health IT vendor count for PY 1 reflects the number of health IT vendors partnering with Track 2 practices at the end of the first program year.

FFS = fee-for-service; M = million; PY = Program Year.

2.B. Comparison of practices that stopped participating in CPC+ and practices that remained

In this Appendix, we examine the characteristics and experiences of the 400 (13 percent) practices that stopped participating in CPC+ by the end of Program Year (PY) 4, and how they differ from the practices that continued to participate in CPC+. Of the 400 practices that stopped participating during the first four years of CPC+, 249 (8 percent of all practices) stopped participating due to an organizational change and 151 (5 percent of all practices) voluntarily withdrew from CPC+ or were terminated by CMS.

The 400 practices no longer participating in CPC+ differed from the practices that remained in CPC+ in several ways. By the end of PY 4, practices that were no longer participating in CPC+—regardless of why they were no longer in CPC+—were *more* likely than the practices that remained in CPC+ to:

- Be Track 1 practices (61 versus 46 percent of practices that remained in CPC+).
- Be independently owned (50 versus 44 percent) at the start of CPC+.
- Have fewer primary care practitioners (that is, be smaller) (62 percent versus 27 percent had one to two practitioners in their most recent CPC+ tracking data).
- Have less experience with advanced approaches to care delivery at the start of CPC+ (49 percent had prior primary care transformation experience, compared to 63 percent of practices that remained in CPC+); and have a lower average score (2.99 versus 3.14) on a measure of advanced care delivery (M2-PCMH-A) in the first year of CPC+.[1]
- Have a higher average risk score (1.14 versus 1.10) for their Medicare fee-for-service (FFS) beneficiaries; and have higher average monthly expenditures per Medicare FFS beneficiary ($906 versus $879).
- Report that the following CPC+ activities were *very burdensome* in their most recent response to the CPC+ Practice Survey: meeting care delivery requirements (23 versus 11 percent), completing care delivery reporting requirements (33 versus 21 percent), and meeting health IT requirements (25 versus 10 percent).
- Have a less favorable opinion of CPC+'s ability to improve the quality of care provided to patients in their most recent response to the CPC+ Practice Survey (37 percent versus 55 percent reported that participating in CPC+ improved the quality of care provided to patients *a lot*) (see Figure 2.B.1).

[1] For a definition of the modified Patient-Centered Medical Home Assessment (M2-PCMH-A) tool, please refer to Figure 2.B.1, footnote d.

The 151 practices that voluntarily withdrew or were terminated differed from practices that remained in their perceptions of Medicare FFS payments and experience with CPC+ payments for participation.[2] Practices that voluntarily withdrew or were terminated, but not practices that withdrew due to an organizational change, were *less* likely than practices that remained to report that Medicare fee-for-service (FFS) payments were adequate or more than adequate (29 versus 51 percent) in their most recent response to the CPC+ Practice Survey. We also examined differences in payments practices received for PY 1 CPC+ participation from CMS and other payers between practices that voluntarily withdrew or were terminated and those that remained.[3] We found that total payments to the practice may be a more important driver than per-practitioner payments for practices' continued participation in CPC+:

- Median PY 1 payments per practice within each track were lower for practices that voluntarily withdrew or were terminated compared to practices that remained in CPC+ (for Track 1, $51,574 versus $92,508; for Track 2, $132,937 versus $208,276).
- However, median PY 1 payments calculated per practitioner were comparable within track (for Track 1, $35,412 versus $32,073; for Track 2, $57,982 versus $52,882).

[2] Payments for participation are payments from CMS and other payer partners to support practices' participation in CPC+. These payments are distinct from payments for performance, which practices received only if they met cost, utilization, and/or quality targets. Payments for participation are typically paid as care management fees and account for about 90 percent of all enhanced payments paid to CPC+ practices. See Chapter 3 for more information on types of payments.

[3] We examined PY 1 payments only, so we would have data for all practices.

Figure 2.B.1. Comparison of 2017 Starters that exited CPC+ in PY 1 to PY 4 and those that remained in CPC+ at the end of PY 4

Compared to practices that remained in CPC+, practices that voluntarily withdrew or were terminated by CMS by the end of PY 4 were more likely to be in Track 1 than Track 2, be independent, be smaller, have less experience with advanced approaches to care delivery at the start of CPC+, and have less-positive perceptions of CPC+.

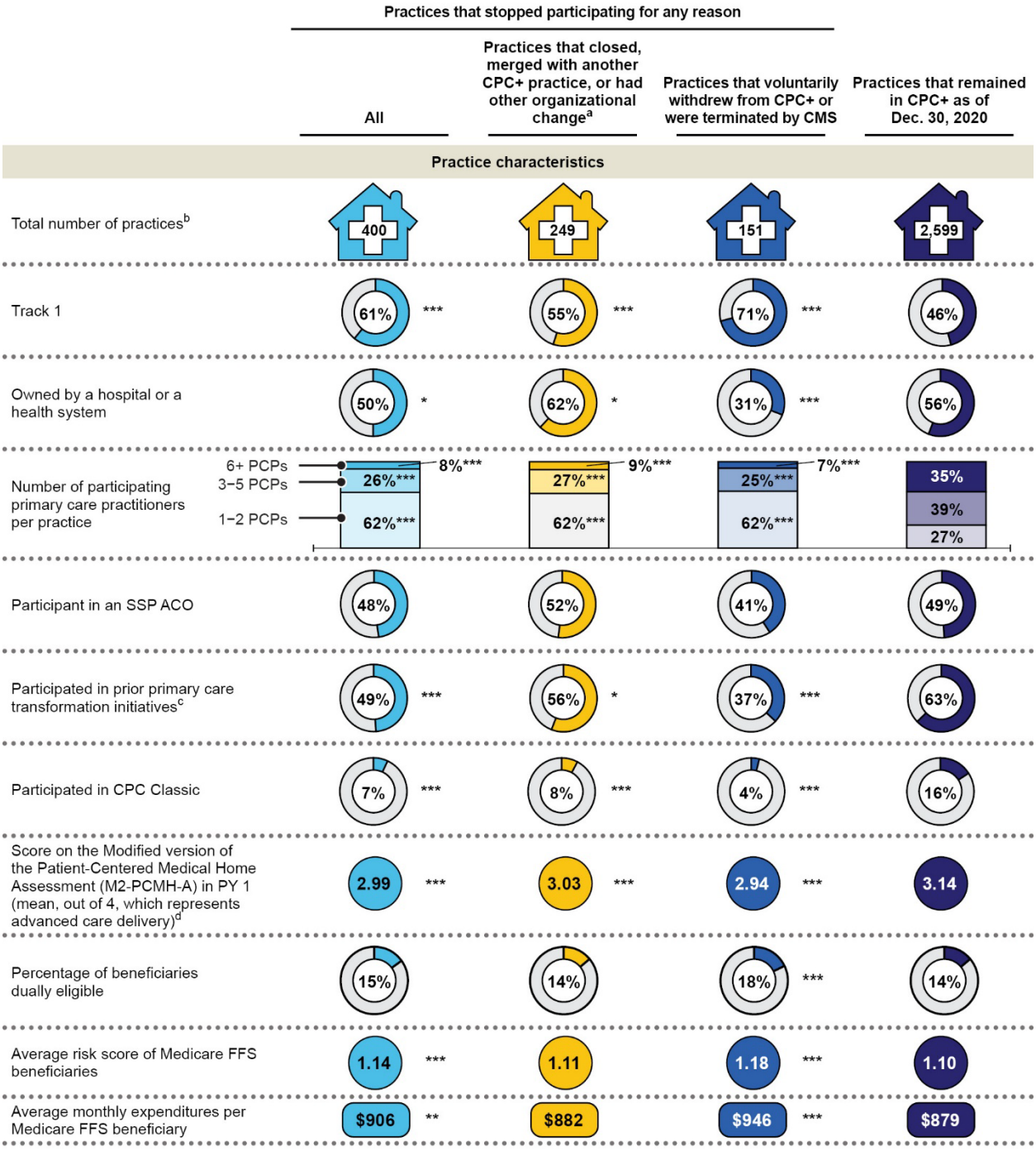


Figure 2.B.1 *(continued)*

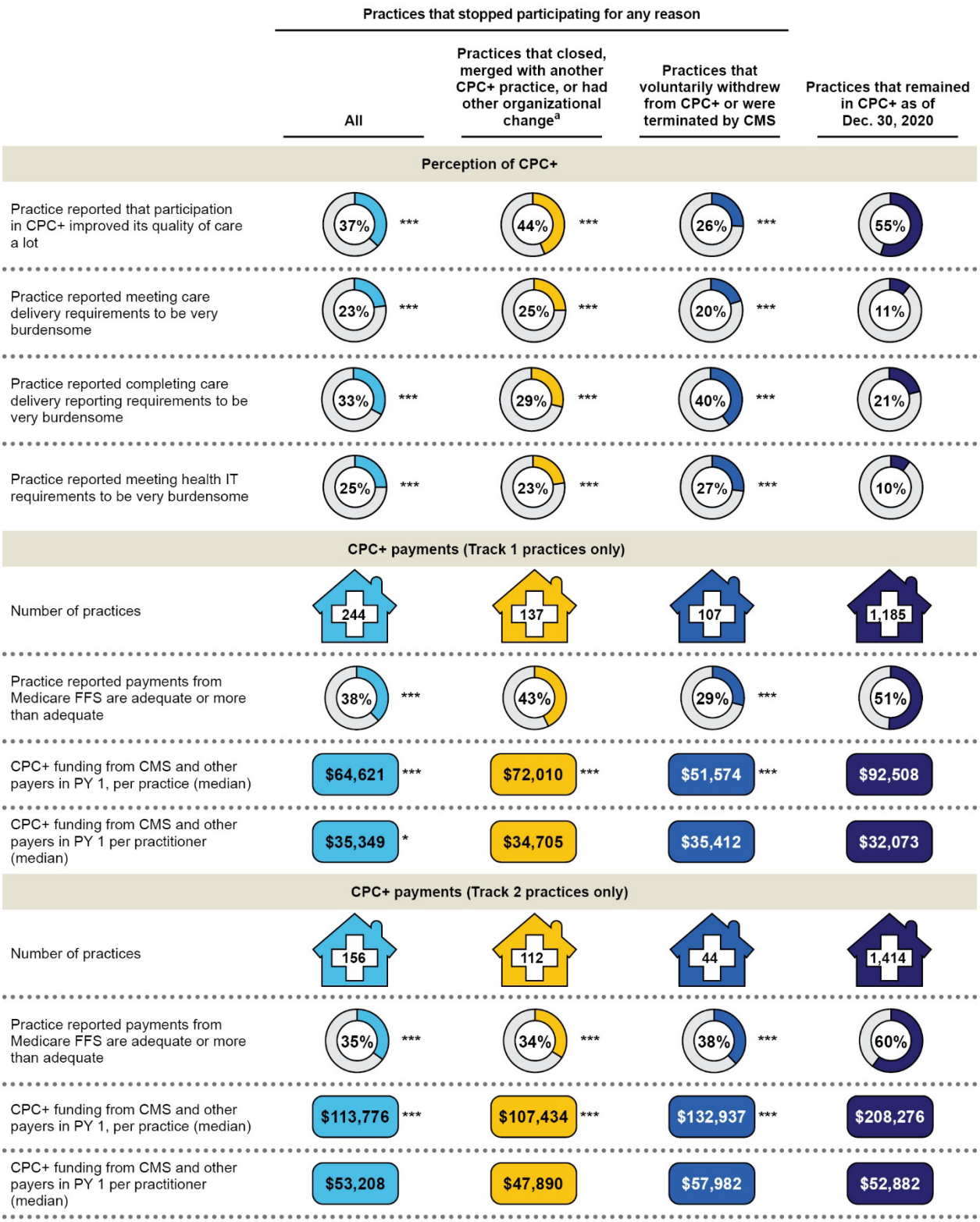


Figure 2.B.1 *(continued)*

Source: Mathematica's analysis of PY 1–PY 4 CPC+ practice tracking data provided by CMS, PY 1 practice-reported financial data submitted to CMS, PY 1 payment data provided by CMS, and data from the independent evaluation's PY 1–PY 4 CPC+ Practice Surveys. Practice characteristics were measured at baseline (before CPC+), with the exception of practice size, which comes from December 2019 or the most recent end-of-year CPC+ practice tracking data available for the practice. Data on practices' payment amounts are based on payments made to practices for PY 1 participation. Data on practices' perception of CPC+ came from the practice's most recently completed CPC+ Practice Survey.

Notes: N = 2,999. We statistically tested differences between practices that remained in CPC+ in PY 4 and (1) practices that left CPC+ for any reason, (2) practices that voluntarily withdrew from CPC+ or were terminated by CMS, and (3) practices that closed, merged with another CPC+ practice, or experienced another organizational change that resulted in their leaving CPC+. The characteristics of the practices that remained in CPC+ as of Dec 30, 2020 may differ from those presented in Figure 2.7. This is because the data presented here was measured before CPC+ to facilitate the comparison of practices that left CPC+ with those that remained whereas the data in Figure 2.7 reflects updated practice characteristics from the end of PY 3.

[a] Organizational change refers to practices that closed, merged with a CPC+ practice, merged with a non-CPC+ practice, were acquired by another organization, adopted a concierge model, or had other changes in ownership. In PY 3, we expanded our definition of organizational change to include withdrawal reasons beyond closures and mergers with CPC+ practices. However, closures and mergers with CPC+ practices still account for 82 percent of this group of withdrawn practices.

[b] Total practices (N = 2,999) includes 94 practices considered "new" in PY 3 and PY 4. Fifty-nine of these new practices were due to an application mistake (multiple practices originally applied to CPC+ as one practice) and the remaining 35 were due to practice growth resulting in formation of additional practices.

[c] We defined participation in prior primary care transformation initiatives as participation in CPC Classic or the Multi-payer Advanced Primary Care Practice demonstration or having medical home recognition before CPC+ (as recognized by the National Committee for Quality Assurance, The Joint Commission, Accreditation Association for Ambulatory Health Care, Utilization Review Accreditation Commission, or state medical-home recognition status).

[d] The CPC+ Practice Survey includes a modified Patient-Centered Medical Home Assessment (M2-PCMH-A) tool, which Mathematica adapted for the CPC+ evaluation to capture approaches to care delivery. Practices were asked to rate their approaches on a scale from 1 (least advanced approach) to 4 (most advanced approach).

ACO = Accountable Care Organization; FFS = fee-for-service; PCP = primary care practitioner; PY = Program Year; SSP = Medicare Shared Savings Program.

*/**/***Difference between this group of practices and the practices that remained in CPC+ (data in the fourth column) was statistically significant at the 0.1/0.05/0.01 level.

This page has been left blank for double-sided copying.

APPENDIX 3

3.A. Payer Survey

This Appendix describes the CPC+ Payer Survey used to assess the details of payer partners' involvement in Comprehensive Primary Care Plus (CPC+). It details survey fielding (Section 1), sampling methods (Section 2), survey content and measures (Section 3), and data tables (Section 4). Section 5 contains the Program Year (PY) 4 survey instrument.

3.A.1. Survey fielding

A. Timing of survey administration

Mathematica administers the CPC+ Payer Survey annually each program year to the payers partnering with CMS in the regions that began CPC+ in 2017.[4] The first wave of the survey was administered from September through December 2017, 9 to 12 months after CPC+ began (Table 3.A.1). The second and third waves of the annual survey were administered from September through December (or the following January) of PYs 2 and 3. The most recent wave of the survey was administered from August through November of PY 4.

Table 3.A.1. CPC+ Payer survey administration dates

Program year	Survey wave	Fielding dates
PY 1	Wave 1	September–December 2017
PY 2	Wave 2	September 2018–January 2019
PY 3	Wave 3	September–December 2019
PY 4	Wave 4	August–November 2020

PY = Program Year.

B. Survey mode, fielding procedures, length, and incentive

Across all four survey waves, we administered the CPC+ Payer Survey as a web survey. At the start of CPC+ and annually afterwards, CMS provided Mathematica with a list of contacts—including name and email address for each CPC+ payer partner, typically someone from the payer's senior leadership who was knowledgeable about the organization's decision making, for example, the director of quality programs.

We administered the surveys over a 14-week field period. At the start of fielding, we sent the payer contacts[5] an email invitation to complete the survey and a link to access it. We sent four email reminders, and made telephone reminder calls to any payers that had not completed the survey by Week 7 (Table 3.A.2).

[4] Mathematica also administered the first three waves of the CPC+ Payer Survey to payers in regions that began CPC+ in 2018, but because the focus of this annual report is on the regions that started CPC+ in 2017, this Appendix reports information about the surveys administered to payers partnering in the 2017 regions only.

[5] In PY 3 and PY 4, we also emailed the survey invitation to the person who completed the survey the previous year, if that was someone different from the primary payer contact for that year.

The survey required 30 to 60 minutes to complete, depending on the number of questions each payer partner had to answer, and—in later rounds—how much data we could prepopulate from prior rounds.[6] Payers were informed that, although their survey responses would be shared with CMS, we would not share them with any other payers or with any primary care practices. Payers were not required to complete the survey, but CMS strongly encouraged them to respond. We did not offer an incentive to complete the survey.

Table 3.A.2. Fielding procedures for PY 4 CPC+ Payer Survey[a]

Week of field period	Fielding activity
Week 1	Initial web survey email invitation mailing
Week 2	Email reminder
Week 5	Second email reminder
Week 7	Telephone reminder call
Week 8	Second telephone reminder call
Week 10	Third reminder email
Week 11	Final reminder email
End of Week 14	Payer survey data collection ended

[a] Similar fielding plans were used for the PY 1, PY 2, and PY 3 CPC+ Payer Surveys.

3.A.2. Sampling, sample sizes, and response rates

For each survey wave, we administered the survey to all payer partners involved in CPC+ at the time of survey administration (Table 3.A.3). We obtained response rates between 84 and 95 percent in each wave.

Table 3.A.3. CPC+ Payer Survey sample sizes and response rates

	PY 1	PY 2	PY 3	PY 4
Number of CPC+ payer partners				
Partnering in CPC+ at the time of the survey[a]	63	64	60	58
Sent surveys	63	64	60	58
Returned surveys	52[b]	59	55	51
In analysis sample[c]	60[b]	54	53	50
Response rate (percentage, unweighted)	**95.2**	**84.3**	**88.3**	**86.2**

[a] One payer partners in eight CPC+ regions and fills out only one survey because they follow a common approach in all eight regions. During data cleaning, we duplicate survey responses for each region in which this payer partners, and we count them separately.

[b] Only 52 of 63 payer partners responded to the PY 1 survey. However, we interviewed 60 of the 63 payer partners in PY 1 and used responses to these interviews to impute survey responses for 8 of the 11 payers that did not respond to the survey; the other 3 payers that did not respond to the survey withdrew from CPC+ before we conducted the interviews.

[c] Our analysis sample excludes payers that had zero attributed lives in each program year and therefore could not provide CPC+ supports.

CPC+ = Comprehensive Primary Care Plus; PY = Program Year.

[6] Beginning in PY 2, to reduce respondent burden for payers, we prepopulated answers based on answers to the prior survey waves.

3.A.3. Survey content

The CPC+ Payer Survey instrument was developed by Mathematica specifically for the evaluation. The PY 4 CPC+ Payer Survey content was largely the same as the surveys used in the previous program years[7] with the exception that, in the PY 4 survey, we added questions about coronavirus disease 2019 (COVID-19) and Primary Care First (PCF), a new CMS model that builds on the principles of CPC+. To develop these new questions, we conducted cognitive pretest interviews with five CPC+ payer partners. The PY 4 survey included questions regarding four general concepts (Table 3.A.4 details the questions in each of the survey's four sections):

1. **NEW IN PY 4: COVID-19**. Questions about how the COVID-19 pandemic may have affected payers' payment policies for all primary care practices they contract with, regardless of whether the practice participates in CPC+.
2. **Payer partnership in CPC+.** Questions about how payers are contracting with CPC+ practices and attributing members to CPC+ practices.
3. **Payers' approach to CPC+ payments**. Questions about the payers' payment approaches for CPC+ and primary care generally—including the type of payments the payers use for primary care practices, the extent to which payers provide care management fees and Performance-based Incentive Payments to CPC+ practices, and the extent to which payers provide other types of payments such as shared savings, enhanced payments, and alternative to FFS payments to CPC+ and non-participating practices.
4. **Payers' approach to using and providing quality measures, data feedback, and technical assistance to primary care practices**. Questions about the extent to which payers use quality measures to calculate primary care payments and provide data feedback and technical assistance to CPC+ and non-participating practices.
5. **How payers' supports for primary care practices may have changed since partnering in CPC+.** Questions about whether payers have made changes to their primary care practice supports (e.g., the amount or frequency of payments to practices) since the start of CPC+, and if so, how much those changes may have been influenced by partnering in CPC+.
6. **NEW IN PY 4: Primary Care First (PCF).** Questions about payers' decisions to partner with CMS in PCF and the reasons for their decisions.

Table 3.A.4 lists the survey sections, survey question content, and number of survey questions per section.

[7] The PY 3 survey was based largely on the PY 2 survey, which built upon the PY 1 survey. The changes for the PY 2 survey included (1) refinements to how we described the payment approaches throughout many of the questions, as we learned from interviews that payer partners used different terminology to describe their approaches; and (2) seven additional questions focused on data feedback and concurrent primary care transformation initiatives. We made these changes to address the relatively large amount of missing data in the PY 1 survey.

Table 3.A.4. Content of the PY 3 CPC+ Payer Survey

Survey section	Content	Number of questions
1	**NEW IN PY 4: COVID-19** • Whether payers waive patient cost-sharing for treatment of COVID-19 or primary care services provided via telehealth • Changes payers have made to their approaches to patient cost-sharing and reimbursing for primary care telehealth services and visits during the COVID-19 pandemic • Whether payers provide any temporary financial supports or interim payment programs to primary care practices or providers during the COVID-19 pandemic • Any differences across payers' lines of business in their approach to COVID-19 cost sharing, reimbursement approaches, and/or financial supports	9
A	**Payer partnership in CPC+** • Lines of business offered • Whether payers attribute or assign members to CPC+ practices • Length of lookback period • Payers' primary claims-based attribution methodology and the frequency with which payers rerun CPC+ attribution • Proportion of self-insured clients who participate in CPC+ and how they are recruited	9
B	**Payment approaches for CPC+** **Questions asked about all payment approaches:** • For each type of CPC+ payment (care management fees, Performance-based Incentive Payments, shared savings payments, enhanced FFS payments, and alternative to FFS payments): • The proportion of practices that receive each payment • The regions in which each payment is provided to practices not participating in CPC+ • The lines of business in which payers offer each payment • Whether payers have different approaches to providing each payment to different practices or lines of business • Whether payers impose restrictions on how practices can use each payment • What specific expenses practices are not allowed to spend each payment on **Care management fees:** • Whether payers adjust care management fees based on patient factors, and if so, which patient factors payers use to adjust care management fees • Whether care management fees are tied to practice performance factors, and if so, which practice metrics or accreditation standards payers use to determine eligibility or adjust fees • If care management fees are adjusted by either patient or practice factors. whether the per member per month (PMPM) care management payment is adjusted by tiers/categories or by continuous values • Average PMPM care management payments (asked separately for Track 1 and Track 2 practices) • If applicable: Adjusted PMPM care management payment by tier *or* adjusted average and range of values for PMPM care management payment	71

Table 3.A.4 *(continued)*

Survey section	Content	Number of questions
	Performance-based Incentive Payments: • Whether payers provide upfront Performance-based Incentive Payments to CPC+ practices • Whether practices are subject to payment recoupments the following year if they do not meet prespecified quality or efficiency benchmarks • Whether payers have finalized Performance-based Incentive Payment calculations based on practices' performance the previous year • Proportion of practices that qualified for Performance-based Incentive Payments based on their performance the previous year **Shared savings:** • Whether payers have finalized shared savings payments based on practices' performance the previous year • Proportion of practices that received shared savings payments based on their performance the previous year • Whether payers include downside risk sharing • The typical maximum percentage of savings and losses payers would share or pass on to practices • Whether payers use a minimum savings rate, and if so, the rate they use • Whether payers made significant changes to their shared savings approach from the previous year, and if so, the significant changes payers made **Enhanced FFS** • Whether payers provide enhanced FFS payments based on practices' performance the previous year • Adjustments payers make when calculating enhanced FFS rates or alternative payment amounts for practices • The percentage by which payers adjust the FFS rate for participation in CPC+ or another primary care transformation initiative • The percentage by which payers adjust FFS payments for performance on utilization, cost, or quality metrics **Alternative to FFS:** • Whether payers receive prospective, alternative payments instead of some or all FFS payments for all, some, or no primary care services • The primary care-specific episodes for which practices are receiving prospective, alternative payments instead of some or all FFS payments • The primary care-specific episodes for which practices are receiving alternative or bundled payments • The maximum adjustment amount for alternative payments based on the following: participation in CPC+ or another primary care transformation initiative; utilization, cost, or quality metrics; and practices' tracks or tiers • The percentage of payments to primary care practices that are paid through FFS versus an alternative to FFS payment approach	

Table 3.A.4 *(continued)*

Survey section	Content	Number of questions
C	**Quality measures, data feedback, and technical assistance** • The metrics payers use to calculate primary care payments and risk-adjust those payments • The primary care-specific episodes payers use to calculate the amount of CPC+ payments or to determine if practices qualify for Performance-based Incentive Payments • Whether payers share data feedback on cost, use, or quality with primary care practices, and the types of data included in their data feedback • The frequency with which payers provide data at the system, practice, practitioner, and patient levels; the format payers use to share data feedback; and whether payers' method of sharing data feedback allows practices to export data • Proportion of practices not participating in CPC+ that receive data feedback on their system, practice, practitioners, or patients • Regions in which practices not selected for CPC+ receive data feedback • How data feedback provided under other primary care programs compares to data feedback for CPC+ practices • Whether payers offer CPC+ practices technical assistance or practice coaching, and the types of assistance payers offer • Whether payers coordinate technical assistance for CPC+ practices with their Regional Learning Network, and the regions in which this is done • Proportion of practices not participating in CPC+ that receive technical assistance, and how it differs from the technical assistance CPC+ practices receive • The supports or services payers offer to CPC+ practices and to CPC+ attributed patients • The types of alternative visits for which payers provide FFS reimbursement to primary care practices	23
D	**Prior and concurrent initiatives** • The changes payers have made to the primary care practice supports, and how much those changes were influenced by partnering in CPC+	2
E	**NEW IN PY 4: Primary Care First** • Whether payers plan to partner with CMS in the Primary Care First (PCF) model in 2021 or 2022 • The factors influencing payers' decisions about whether or not to partner in PCF • The challenges payers anticipate about partnering in PCF	5
Total number of questions	**--**	**119**

FFS = fee-for service; PCF = Primary Care First; PMPM = per member per month; PY = Program Year.

3.A.4. Data cleaning and data tables

A. Data cleaning steps

In addition to standard data entry quality control and data quality checks, Mathematica also executed a few additional cleaning steps for the CPC+ Payer Survey each wave. The data cleaning steps include:

1. *Duplicated payers' responses to ensure payers operating in multiple regions had a completed survey for each region.* One payer operating in multiple regions requested to complete one survey to represent their responses for all regions in which they are partnering —and indicated that they use a uniform approach across regions. We duplicated this payer's responses for each region. All other payers were asked to complete one survey for each region in which they were partnering.
2. *Revised responses for payers whose involvement in CPC+ was only as a Medicaid managed care organization (MCO).* In two regions, the Medicaid agencies set the payment policy for Medicaid MCOs in their respective states. If a payer was only participating in CPC+ as an MCO in these regions, we overwrote their responses to payment-related questions with the responses we received from the state Medicaid agencies, because the state Medicaid agencies predetermined all CPC+ payments related to participation for the MCOs.
3. *Revised responses for payers that made errors in their responses.* We reviewed each completed survey and compared responses to previous years' surveys. In some instances, we identified potential errors in payers' responses. In those cases, we reached out to the payer via email to (1) confirm our understanding of their response and suggest ways to change the response, or (2) schedule a brief interview to discuss multiple responses. After a payer agreed with our suggested change, we updated the survey.
4. *Backcoding other responses.* A few survey questions allowed payers to provide "other" (free-text) responses if they wanted to elaborate on their approach beyond the response options in the survey. In many instances, we recoded those "other" responses because they did fit into one of the response options.

B. Software

We conducted all data cleaning using SAS version 9.4.

C. Data tables

This section presents data tables showing the responses of 50 of the 58 CPC+ payer partners that partnered with 2017 regions, were participating in CPC+ in PY 4, and responded to the PY 4 CPC+ Payer Survey. In the data tables, we present the number of payer partners that selected each response option and the relevant data statistics (e.g., percentage of payers, median response) for most questions in the PY 4 CPC+ Payer Survey. We did not include responses to questions that asked payer partners to report average per member per month care management payments by tiers, lines of business and their minimum savings rate, and questions about partial or full capitation, because we found that payer partners inconsistently interpreted the questions.

- Table 3.A.5 presents payer partners' responses to questions in the first section of the survey, "COVID-19."
- Table 3.A.6 presents payer partners' responses to questions in Section A of the survey, "Payer Partnership in CPC+."
- Tables 3.A.7–3.A.15 present payer partners' responses to questions in Section B of the survey, "Payment approaches for CPC+."
- Tables 3.A.16–3.A.18 present payer partners' responses to questions in Section C of the survey, "Quality Measures, Data Feedback, and Technical Assistance."
- Table 3.A.19 presents payer partners' responses to questions in Section D of the survey, "Prior and Concurrent Initiatives."

D. COVID-19

Table 3.A.5. COVID-19 pandemic and payment policies, Program Year 4

	n	%
Is your organization waiving patient cost-sharing for treatment of COVID-19?		
Yes, all patient cost-sharing for COVID-19 treatment is being waived	31	65
Yes, some patient cost-sharing for COVID-19 treatment is being waived or reduced	3	6
No, all standard patient cost-sharing for COVID-19 treatment still applies	1	2
No waivers necessary; our coverage prior to the COVID-19 pandemic did not require patient cost-sharing for treatments like those for COVID-19	13	27
N	48	
During the COVID-19 pandemic, is your organization waiving patient cost-sharing for primary care services provided via telehealth? Please note, this question is asking about any primary care telehealth service, not just telehealth for COVID-19.		
Yes, all patient cost-sharing for primary care telehealth is being waived	26	54
Yes, some patient cost-sharing for primary care telehealth is being waived or reduced	5	10
No, all standard patient cost-sharing for primary care telehealth still applies as before the COVID-19 pandemic	3	6
No waivers necessary; our coverage prior to the COVID-19 pandemic did not require patient cost-sharing for primary care telehealth services	14	29
N	48	
During the COVID-19 pandemic, percentage of organizations reimbursing for… *(select all that apply)*		
Telehealth visits conducted by physicians (MDs and DOs)	48	100
Telehealth visits conducted by non-physician staff (NPs, PAs, or others)	48	100
Telehealth behavioral health visits conducted by physicians or non-physician staff	46	96
Telehealth visits conducted via HIPAA-compliant technology	47	98
Telehealth visits conducted via non-HIPAA compliant technology (for example, Skype, Zoom, FaceTime, or comparable technologies)	45	94
Telehealth visits conducted via telephone	39	81
N	48	
Among payers reimbursing for the following primary care telehealth visits during the COVID-19 pandemic, percentage of payers that changed this approach due to COVID-19		
Telehealth visits conducted by physicians (MDs and DOs)	17	35
N	48	
Telehealth visits conducted by non-physician staff (NPs, PAs, or others)	20	42
N	48	
Telehealth behavioral health visits conducted by physicians or non-physician staff	13	28
N	46	
Telehealth visits conducted via HIPAA-compliant technology	4	9
N	47	
Telehealth visits conducted via non-HIPAA compliant technology (for example, Skype, Zoom, FaceTime, or comparable technologies)	39	87
N	45	
Telehealth visits conducted via telephone	28	72
N	39	
How does your reimbursement rate for primary care telehealth visits during the COVID-19 pandemic compare to your reimbursement rates for in-person visits?		
We reimburse all telehealth visits at rates on par with in-person visits	39	81
We reimburse some, but not all, telehealth visits at rates on par with in-person visits	7	15
We reimburse all of our telehealth visits at rates lower than the rates for in-person visits	2	4
N	48	
Has your approach to reimbursement for primary care telehealth visits during the COVID-19 pandemic changed due to COVID-19?		
Yes	26	54
No	22	46
N	48	

Table 3.A.5 *(continued)*

	n	%
Is your organization providing any of the following temporary financial supports or interim payment programs to primary care practices or providers during the COVID-19 pandemic? *(select all that apply)*		
Increased fee-for-service (FFS) payment rates	4	8
Increased capitation payment rates	2	4
Increased care management fee payment rates	0	0
Providing accelerated payments of any kind to practices or providers (for example, providing care management fee payments ahead of schedule to help practices implement COVID-19 responses or ease cash flow problems)	28	57
Postponing recoupment of funds owned by practices or providers	11	22
Easing the requirements for practices or providers to earn performance-based payments (such as shared savings or bonus payments)	12	24
Providing loans directly to practices or providers	4	8
Providing loan guarantees, meaning loans that practices or providers receive from financial institutions that your organization is guaranteeing	0	0
Providing grants directly to practices or providers	8	16
No, we are not providing any financial supports to primary care practices or providers due to the COVID-19 pandemic	5	10
Other	8	16
N	49	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

E. Payer partnership in CPC+

Table 3.A.6. CPC+ payer partner participation: lines of business, attribution, and self-insurance, Program Year 4

	n	%
Percentage of payers offering the following line(s) of business in 2020 (*select all that apply*)		
Commercial: fully insured products	33	66
Commercial: self-insured products (third-party administrator (TPA)/administrative services only (ASO)	33	66
Health insurance marketplace plan(s)	22	44
State/federal high-risk pools	3	6
Medicare Advantage	33	66
Medicaid/CHIP managed care plan(s)	29	58
Medicaid managed care organization (MCO) only	8	16
Medicaid/CHIP fee-for-service (FFS)	13	26
N	50	
How do you attribute or assign members to CPC+ practices? *(select all that apply)*		
Members select or are assigned to a primary care provider (typically at enrollment)	33	67
Members are attributed to a CPC+ practice using a claims-based attribution methodology	38	78
Other	15	31
N	49	

	n	Number of months
Among payers with claims-based attribution, how many months do you use for the look-back period to attribute members to CPC+ practices?		
Primary look-back period (1–48 months)		
Median		24
Minimum		6
Maximum		27
N	38	
If no visits during primary look-back period, secondary look-back period (0–48 months)		
Median		12
Minimum		0
Maximum		48
N	21	

	n	%
Among payers with claims-based attribution, what is your primary claims-based attribution methodology?		
Members are attributed to the primary care practice they visited most frequently during the look-back period (i.e., plurality of visits)	26	68
Members are attributed to the primary care practice they last visited during the look-back period	11	29
Other	1	3
N	38	
Among payers with claims-based attribution, how frequently do you rerun CPC+ attribution?		
Monthly	19	50
Quarterly	17	45
Twice a year	0	0
Yearly	2	5
Other	0	0
N	38	

Table 3.A.6 *(continued)*

	n	%
Among payers with claims-based attribution, can CPC+ practices appeal attribution of certain members?		
Yes	17	45
No	21	55
N	38	
Among payers with commercial self-insured lines of business, how many commercial self-insured clients participate in CPC+?		
All commercial self-insured clients	6	19
Most commercial self-insured clients	6	19
Some commercial self-insured clients	14	45
No commercial self-insured clients	5	16
N	31	
Among payers with self-insured lines of business, which of the following strategies are used to recruit self-insured clients to participate in CPC+?"		
All commercial self-insured clients are required to participate in CPC+	4	13
Commercial self-insured clients are enrolled in CPC+ unless they opt out of participation	13	42
Commercial self-insured clients can opt into CPC+ participation	14	45
N	31	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

FFS = fee-for-service; MCO = managed care organization.

F. Payment approaches for CPC+

Table 3.A.7. CPC+ payer partner payments overview: payment approaches and payment metrics, Program Year 4

	n	%
Payers using a payment approach for any CPC+ practices in 2020 *(select all that apply)*		
Care management fees	46	92
Performance-based Incentive Payments or pay for performance	39	78
Shared savings model	29	58
Enhanced FFS payments	5	10
CPCP payments or capitation (partial or full) or global payments	12	24
Prospective bundled payments for primary-care focused episodes of care	3	6
Other	5	10
N	50	
Payers planning to use a payment approach for any CPC+ practices in 2021 *(select all that apply)*		
Care management fees	45	90
Performance-based Incentive Payments or pay for performance	41	82
Shared savings model	31	62
Enhanced FFS payments	7	14
CPCP payments or capitation (partial or full) or global payments	20	40
Prospective bundled payments for primary-care focused episodes of care	6	12
Other	5	10
N	50	
Payers providing CPC+ payments for participation, performance, or alternative to FFS…		
Any CPC+ payments	50	100
Any CPC+ payments for participation (care management fees)	47	94
Any performance-based CPC+ payments (Performance-based Incentive Payment or pay for performance, shared savings model, and performance-adjusted enhanced FFS payments)	49	98
Any alternative to FFS payment in current year (CPCP payments, capitation or global payments, prospective bundled payments for primary-care focused episodes of care)	15	30
Any alternative to FFS payment planned for next year	24	48
N	50	
Among payers providing any CPC+ payments for participation, payers providing any CPC+ payments for participation with…		
CPC+ care management fees not tied to performance factors	30	64
CPC+ care management fees where practices have to meet performance benchmarks to be eligible for CMF	15	32
CPC+ care management fees where practices have to meet performance benchmarks to determine amount of CMF	5	11
CPC+ enhanced FFS adjusted based on participation in CPC+ or another primary care transformation	3	6
N	47	
Among payers providing any CPC+ payments for performance, payers providing any CPC+ payments for performance with performance-adjusted enhanced FFS		
Performance-adjusted enhanced FFS	3	6
N	49	
Among payers providing any alternative to FFS payments to CPC+ practices, payers offering pilot or full alternative to FFS CPC+ payment programs in 2020 based on information from 2020 payer interviews		
Pilot alternative to FFS	4	25
Full alternative to FFS	12	75
N	16	

Table 3.A.7 *(continued)*

	n	%
In 2020, are you using these metrics to calculate primary care payments? *(select all that apply)*		
Claims-based cost and utilization measures	40	82
Average cost for primary care specific episodes	1	2
Claims-based quality measures	34	69
Electronic Clinical Quality Measures (eCQMs)	21	43
Patient experience measures (e.g., CAHPS)	10	20
Other	3	6
N	49	
Among payers using each metric to calculate primary care payments, do you risk adjust any of the following metrics?		
Claims-based cost and utilization measures	22	55
N	40	
Average cost for primary care specific episodes	s.s	s.s
N	s.s	
Claims-based quality measures	3	9
N	34	
Electronic Clinical Quality Measures (eCQMs)	0	0
N	21	
Patient experience measures (e.g., CAHPS)	s.s	s.s
N	s.s	
Other	s.s	s.s
N	s.s	
Among payers using average cost for primary care-specific episodes to calculate primary care payments, what primary care-specific episodes are you using to calculate the amount of CPC+ payments or to determine if practices qualify for Performance-based Incentive Payments in 2020? *(select all that apply)*		
Urinary tract infection	s.s	s.s
Cellulitis	s.s	s.s
HIV	s.s	s.s
Hepatitis C	s.s	s.s
Bronchiolitis and RSV pneumonia	s.s	s.s
Hemophilia	s.s	s.s
CAD and angina	s.s	s.s
Sickle cell	s.s	s.s
Hypotension	s.s	s.s
Dermatitis/urticarial	s.s	s.s
Upper respiratory infection (outpatient)	s.s	s.s
Attention-deficit/hyperactivity disorder (ADHD)	s.s	s.s
Oppositional defiant disorder (ODD)	s.s	s.s
Otitis Media	s.s	s.s
Depression	s.s	s.s
Anxiety	s.s	s.s
Headache	s.s	s.s
Low back pain	s.s	s.s
Asthma	s.s	s.s
Chronic obstructive pulmonary disease (COPD)	s.s	s.s
Perinatal care	s.s	s.s
Other	s.s	s.s
N	s.s	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents. s.s. = small sample. Cells with fewer than 11 responses have been suppressed.

CPCP = Comprehensive Primary Care Payments; CAHPS = Consumer Assessment of Healthcare Providers and Systems; CMF = care management fee; FFS = fee-for-service; PY = Program Year.

Table 3.A.8. Proportion of primary care practices receiving care management fees from payers, among payers offering care management fees, Program Year 4

	CPC+ Track 1		CPC+ Track 2		Non-CPC+ primary care practices	
	n	%	n	%	n	%
How many practices are receiving care management fees?						
None	0	0	2	4	7	15
Some	2	4	1	2	24	52
Most	11	24	11	24	6	13
All	33	72	32	70	9	20
N	46		46		46	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

Table 3.A.9. CPC+ payers' approach to care management fees, among payers offering care management fees to CPC+ practices, Program Year 4

	n	%
In 2020, for which line(s) of business are you offering your CPC+ care management fees? *(select all that apply)*		
Commercial: fully insured products	28	61
Commercial: self-insured products (third-party administrator (TPA)/administrative services only (ASO)	23	50
Health insurance marketplace plan(s)	14	30
State/federal high-risk pools	0	0
Medicare Advantage	18	39
Medicaid/CHIP managed care plan(s)	22	48
Medicaid/CHIP fee-for-service (FFS)	4	9
N	46	
Among payers providing care management fees across multiple lines of business, do your 2020 CPC+ care management fees for CPC+ practices differ by line of business?		
Yes	21	72
No	8	28
N	29	
Do you adjust your care management fees based on any patient factors such as demographics, patient risk score, patient category, or patient health status?		
Yes	22	48
No	24	52
N	46	
Among payers adjusting care management fees based on patient factors, what patient factors do you use to adjust your care management fees? *(select all that apply)*		
Adjust for demographic characteristics (such as age or sex)	2	9
Adjust for patient risk score (such as Hierarchical Condition Category [HCC] risk score, 3M Clinical Risk Groups [CRG], Milliman Advanced Risk Adjusters [MARA], or DxCG)	20	91
Adjust for patients' prior cost or service use	0	0
Other	5	23
N	22	
In addition to CMS CPC+ requirements, do you use any factors tied to practice or practitioner performance—such as utilization, cost, or quality metrics, or accreditation standards such as Patient-Centered Medical Home (PCMH) participation—to determine… *(select all that apply)*		
Whether practices are eligible to receive any care management fees	15	33
The amount of care management fees a practice may receive	5	11
None of the above	30	65
N	46	
Among payers using practice or practitioner performance factors to determine practice eligibility to receive care management fees, which metrics or accreditation standards do you use to determine practice eligibility to receive care management fees? *(select all that apply)*		
Practice performance on utilization metrics	9	60
Practice performance on cost metrics	9	60
Practice performance on quality metrics	13	87
Achieving Patient-Centered Medical Home (PCMH) recognition or PCMH tier	2	13
Other	2	13
N	15	

Table 3.A.9 *(continued)*

	n	%
Among payers using practice or practitioner performance factors to determine the amount of care management fees a practice may receive, which metrics or accreditation standards do you use to adjust the care management fee amount a practice receives? *(select all that apply)*		
Practice performance on utilization metrics	s.s	s.s
Practice performance on cost metrics	s.s	s.s
Practice performance on quality metrics	s.s	s.s
Achieving Patient-Centered Medical Home (PCMH) recognition or PCMH tier	s.s	s.s
Other	s.s	s.s
N	s.s	
Among payers using practice or practitioner performance factors to determine the amount of care management fees a practice may receive, percentage of 2020 care management fees dependent on practice performance for a typical CPC+ practice		
Median		s.s
Minimum		s.s
Maximum		s.s
N	s.s	
Among payers adjusting care management fees based on patient factors or practice/practitioner performance, how did you adjust the PMPM care management payments provided to your Track 1 CPC+ practices in 2020?		
Tiers or categories	14	70
Continuous values	6	30
N	20	
Among payers providing care management fees to both CPC+ Track 1 and Track 2 practices, are your 2020 care management fees different for Track 1 and Track 2 CPC+ practices?		
Yes	23	53
No	17	40
N	43	
Do you impose any restrictions on how practices can use the CPC+ care management fees you provide them?		
Yes	2	4
No	44	96
N	46	
Among payers that impose restrictions on how practices use care management fees, what expenses are practices NOT allowed to spend CPC+ care management fees on? *(select all that apply)*		
Our restrictions are identical to CMS (all the options below are NOT allowed)	s.s	s.s
Bonus payments to primary care practitioners or staff	s.s	s.s
Payments to specialists	s.s	s.s
Contracted services without practice oversight, such as from a care management company	s.s	s.s
Health information technology	s.s	s.s
Fees for accreditation	s.s	s.s
Durable medical equipment	s.s	s.s
Diagnostic and imaging equipment	s.s	s.s
Medications	s.s	s.s
Practitioner or staff training or continuing medical education credits	s.s	s.s
Income and business tax payments	s.s	s.s
Other	s.s	s.s
N	s.s	

Table 3.A.9 *(continued)*

	n	%
Among payers providing care management fees to CPC+ Track 1 and non-CPC+ practices, how do your care management fee payment levels for other non-CPC+ practices compare to your payments for Track 1 CPC+ practices?		
Payments under other programs are generally higher than CPC+ payments for Track 1	2	5
Payments under other programs are about the same as CPC+ payments for Track 1	27	69
Payments under other programs are generally lower than CPC+ payments for Track 1	10	26
N	39	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents. s.s.= small sample. Cells with fewer than 11 responses have been suppressed.

FFS = fee-for-service; MCO = managed care organization; PMPM = per member per month.

.

Table 3.A.10. Proportion of primary care practices that are eligible for payers' Performance-based Incentive Payments, among payers offering Performance-based Incentive Payments to CPC+ practices, Program Year 4

	CPC+ Track 1		CPC+ Track 2		Non-CPC+ primary care practices	
	n	%	n	%	n	%
How many practices are potentially eligible to receive Performance-based Incentive Payments?						
None	5	13	5	13	9	23
Some	4	10	6	15	12	31
Most	11	28	10	26	10	26
All	19	49	18	46	8	21
N	39		39		39	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

Table 3.A.11. CPC+ payers' approaches to Performance-based Incentive Payments, among payers offering them to CPC+ practices, Program Year 4

	n	%
In 2020, for which line(s) of business are you offering CPC+ Performance-based Incentive Payments? *(select all that apply)*		
Commercial: fully insured products	21	62
Commercial: self-insured products (third-party administrator (TPA)/administrative services only (ASO)	14	41
Health insurance marketplace plan(s)	0	0
State/federal high-risk pools	15	44
Medicare Advantage	19	56
Medicaid/CHIP managed care plan(s)	13	38
Medicaid/CHIP fee-for-service (FFS)	3	9
N	34	
Among payers providing Performance-based Incentive Payments to both CPC+ and non-CPC+ practices, do you have a different approach to providing Performance-based Incentive Payments for CPC+ practices versus other primary care practices that are not participating in CPC+?		
Yes	2	7
No	28	93
N	30	
Among payers providing Performance-based Incentive Payments to both CPC+ Track 1 and Track 2 practices, do you have a different approach to providing Performance-based Incentive Payments for Track 1 CPC+ practices versus Track 2 CPC+ practices?		
Yes	3	9
No	31	91
N	34	
Among payers offering Performance-based Incentive Payments across multiple lines of business, do you have a different approach to providing Performance-based Incentive Payments for different lines of business?		
Yes	8	38
No	13	62
N	21	
In 2020, are you providing upfront Performance-based Incentive Payments to CPC+ practices?		
Yes, practices receive an upfront, prospective incentive payment, later reconciled based on performance	5	15
No, payments are made at end of performance period	29	85
N	34	
Among payers providing upfront Performance-based Incentive Payments to CPC+ practices, will practices be subject to a payment recoupment the following year if they do not meet prespecified quality or efficiency benchmarks?		
Yes	s.s	s.s
No	s.s	s.s
N	s.s	
Have you finalized your Performance-based Incentive Payment calculations based on practices' performance in 2019?		
Yes	25	74
No	9	26
N	34	
Do you impose any restrictions on how practices can use the CPC+ Performance-based Incentive Payments you provide them?		
Yes	0	0
No	34	100
N	34	

Table 3.A.11 *(continued)*

	n	%
What expenses are practices NOT allowed to spend CPC+ Performance-based Incentive Payments on? *(select all that apply)*		
Bonus payments to primary care practitioners or staff	s.s	s.s
Payments to specialists	s.s	s.s
Contracted services without practice oversight, such as from a care management company	s.s	s.s
Health information technology	s.s	s.s
Fees for accreditation	s.s	s.s
Durable medical equipment	s.s	s.s
Diagnostic and imaging equipment	s.s	s.s
Medications	s.s	s.s
Practitioner or staff training or continuing medical education credits	s.s	s.s
Income and business tax payments	s.s	s.s
Other	s.s	s.s
N	s.s	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents. s.s. = small sample. Cells with fewer than 11 responses have been suppressed.

Table 3.A.12. Proportion of primary care practices qualifying for payers' Performance-based Incentive Payments, among payers offering Performance-based Incentive Payments to CPC+ practices, Program Year 4

	CPC+ Track 1		CPC+ Track 2		Non-CPC+ primary care practices	
	n	%	n	%	n	%
What proportion of practices qualified for Performance-based Incentive Payments based on their performance in 2019?						
None	1	4	2	8	4	16
Some	6	24	6	24	9	36
Most	12	48	11	44	9	36
All	6	24	6	24	3	12
N	25		25		25	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

Table 3.A.13. Proportion of primary care practices participating in shared savings program, among payers offering shared savings programs to CPC+ practices, Program Year 4

	CPC+ Track 1		CPC+ Track 2		Non-CPC+ primary care practices	
	n	%	n	%	n	%
How many practices are participating in a shared savings program?						
None	8	28	6	21	7	24
Some	4	14	4	14	7	24
Most	4	14	5	17	12	41
All	13	45	14	48	3	10
N	29		29		29	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

Table 3.A.14. CPC+ payers' approach to shared savings programs, among payers offering shared savings programs to CPC+ practices, Program Year 4

	n	%
In 2020, for which line(s) of business are you offering your shared savings program? *(select all that apply)*		
Commercial: fully insured products	20	83
Commercial: self-insured products (third-party administrator (TPA)/administrative services only (ASO)	10	42
Health insurance marketplace plan(s)	0	0
State/federal high-risk pools	18	75
Medicare Advantage	9	38
Medicaid/CHIP managed care plan(s)	10	42
Medicaid/CHIP fee-for-service (FFS)	0	0
N	24	
Among payers providing shared savings for both CPC+ and non-CPC+ practices, do you have a different approach to providing shared savings for CPC+ practices versus other primary care practices that are not participating in CPC+?		
Yes	8	36
No	14	64
N	22	
Among payers providing shared savings for both CPC+ Track 1 and Track 2 practices, do you have a different approach to providing shared savings for Track 1 CPC+ practices versus Track 2 CPC+ practices?		
Yes	1	5
No	20	95
N	21	
Among payers offering shared savings across multiple lines of business, do you have a different approach to providing shared savings for different lines of business?		
Yes	13	65
No	7	35
N	20	
For 2020, what is the typical maximum percentage of savings you would share with practices?		
Median		s.s
Minimum		s.s
Maximum		s.s
N	s.s	
In 2020, will you include downside risk sharing?		
Yes	6	26
No	17	74
N	23	
Among payers including downside risk sharing, what is the maximum typical percentage of losses you would pass on to practices for 2020?		
Median		s.s
Minimum		s.s
Maximum		s.s
N	s.s	
For 2020, do you use a minimum savings rate (that is, a threshold that must be surpassed before savings are shared with practices)?		
Yes	9	39
No	14	61
N	23	

Table 3.A.14 *(continued)*

	n	%
What is the minimum savings rate?		
Median		s.s
Minimum		s.s
Maximum		s.s
N	s.s	
Have you finalized your shared savings payment calculations based on practices' performance in 2019?		
Yes	14	61
No	9	39
N	23	
Compared to 2019, did you make any other significant changes to your shared savings approach in 2020?		
Yes	1	5
No	21	95
N	22	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents. s.s. = small sample. Cells with fewer than 11 responses have been suppressed.

Table 3.A.15. Proportion of primary care practices receiving shared savings payments, among payers offering shared savings programs to CPC+ practices, Program Year 4

	CPC+ Track 1		CPC+ Track 2		Non-CPC+ primary care practices	
	n	%	n	%	n	%
What proportion of practices received shared savings payments based on their performance in 2019?						
None	6	46	4	31	3	23
Some	5	38	7	54	7	54
Most	2	15	2	15	3	23
All	0	0	0	0	0	0
N	13		13		13	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

G. Quality measures, data feedback, and technical assistance

Table 3.A.16. CPC+ payer partner data feedback, Program Year 4

	n	%
Do you currently share data feedback on cost, use, and/or quality with primary care practices?		
Yes	47	96
No, but will before end of year	1	2
No, will not provide	1	2
N	49	
Among payers who are or will be providing data feedback, what type of data are included in your data feedback in 2020? *(select all that apply)*		
Claims-based cost and utilization measures	44	92
Average cost for primary care-specific episodes	12	25
Claims-based quality measures	47	98
eCQMs	20	42
Patient experience measures (e.g., CAHPS)	8	17
Specialists cost data	19	40
Hospital cost data	20	42
Other	4	8
N	48	
Among payers who are or will be providing data feedback, percentage of payers providing data feedback at the following levels *(select all that apply)*		
System level	33	69
Practice level	47	98
Practitioner level	43	90
Patient level	48	100
N	48	
Among payers who are or will be providing data feedback, percentage of the most frequent data provided		
Quarterly	15	31
Monthly	23	48
Weekly	1	2
Real-time	7	15
Other	2	4
N	48	
Among payers who are or will be providing data feedback, how frequently do you provide data at the system level?		
Never, data not provided at that level	15	31
Quarterly	12	25
Monthly	15	31
Weekly	1	2
Real-time	3	6
Other	2	4
N	48	
Among payers who are or will be providing data feedback, how frequently do you provide data at the practice level?		
Never, data not provided at that level	1	2
Quarterly	20	42
Monthly	20	42
Weekly	1	2
Real-time	3	6
Other	3	6
N	48	

Table 3.A.16 *(continued)*

	n	%
Among payers who are or will be providing data feedback, how frequently do you provide data at the practitioner level?		
Never, data not provided at that level	5	10
Quarterly	17	35
Monthly	16	33
Weekly	1	2
Real-time	4	8
Other	5	10
N	48	
Among payers who are or will be providing data feedback, how frequently do you provide data at the patient level?		
Never, data not provided at that level	0	0
Quarterly	14	29
Monthly	22	46
Weekly	1	2
Real-time	7	15
Other	4	8
N	48	
Among payers who are or will be providing data feedback, percentage of payers sharing data feedback in the following formats…		
Static only	14	29
Interactive data portal only	15	31
Other only	0	0
Both static and interactive data portal	10	21
Both interactive data portal and other	1	2
N	48	
Among payers who are or will be providing data feedback, what format do you use for sharing data feedback? *(select all that apply)*		
Static report	32	67
Interactive data portal	34	71
Other	9	19
N	48	
Among payers who are or will be providing data feedback, does your method of sharing data feedback allow practices to export the data or receive a data dump to manipulate the data themselves?		
Yes	45	94
No	3	6
N	48	
Among payers who are or will be providing data feedback, how many practices that are NOT participating in CPC+ are receiving data feedback on their system, practice, practitioners, or patients in 2020?		
None	2	4
Some	18	38
Most	23	48
All	5	10
N	48	
Among payers providing data feedback to at least some practices not participating in CPC+, how does your data feedback provided under other primary care programs compare to your data feedback for CPC+ practices?		
Data feedback is more comprehensive than feedback provided to CPC+ practices	7	15
Data feedback is about the same as feedback provided to CPC+ practices	38	83
Data feedback is less comprehensive than feedback provided to CPC+ practices	1	2
N	46	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

CAHPS = Consumer Assessment of Healthcare Providers and Systems; eCQM = electronic Clinical Quality Measures.

Table 3.A.17. CPC+ payer partner learning support, Program Year 4

	n	%
Are you offering CPC+ practices technical assistance or practice coaching?		
Yes	44	90
No	5	10
N	49	
Among payers providing technical assistance or practice coaching, what type of assistance are you offering CPC+ practices in 2020? *(select all that apply)*		
In-person group learning sessions	25	57
Web-based group learning sessions	35	80
Individualized practice coaching	39	89
Other	5	11
N	44	
Among payers providing technical assistance or practice coaching, are you coordinating technical assistance for CPC+ practices with your regional learning network?		
Yes	23	52
No	21	48
N	44	
Among payers providing technical assistance or practice coaching, how many practices that are NOT participating in CPC+ are receiving technical assistance in 2020?		
None	3	7
Some	27	61
Most	8	18
All	6	14
N	44	
Among payers providing technical assistance or practice coaching to non-CPC+ practices, how does your technical assistance provided under other primary care programs compare to your technical assistance for CPC+ practices?		
Technical assistance is more intensive than the support provided to CPC+ practices	0	0
Technical assistance is about the same as the support provided to CPC+ practices	37	90
Technical assistance is less intensive than the support provided to CPC+ practices	4	10
N	41	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Table 3.A.18. Other CPC+ payer partner initiatives and supports, Program Year 4

	n	%
Do you offer any of the following other supports or services to CPC+ practices or directly to CPC+ attributed patients? *(select all that apply)*		
Care managers for practices	13	27
Practice coaching	16	33
Social services supports (e.g., assessments and/or referral to social services agencies)	20	41
Behavioral health integration supports (e.g., embedded behavioral health staff, reimbursement for behavioral health services provided in primary care settings)	16	33
Embedded pharmacists for practices	5	10
Fee-for-service reimbursement for alternative visits (such as home-based care, video-based conferencing, or eVisits)	23	47
Other	2	4
None of the above	9	18
N	49	
Among payers that offer fee-for-service reimbursement for alternative visits, percentage of payers providing FFS reimbursement to primary care practices for the following types of alternative visits… *(select all that apply)*		
Visits in alternative locations (for example, nursing facilities or senior centers)	10	43
Home-based care (i.e., primary care home visits)	12	52
Medical group visits (i.e., shared medical appointments)	8	35
Video-based conferencing (i.e., telehealth or telemedicine)	21	91
Medical visit over an electronic exchange (for example, eVisit, portal)	9	39
Medical visit via telephone (i.e., phone visit)	17	74
Other	0	0
N	23	
Do you offer any of the following other supports or services directly to CPC+ attributed patients? *(select all that apply)*		
Advance care planning	11	22
Telephonic care management	27	55
Medication therapy reviews	15	31
Disease management programs	33	67
Health and wellness services	30	61
None of the above	12	24
N	49	

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents.

H. Prior and concurrent initiatives

Table 3.A.19. Percentage of CPC+ payer partners who reported changing the supports they provide to primary care practices and whether the change was influenced by CPC+, Program Year 4

	Have you made any of the following changes to supports for primary care practices?	If yes, how much were those changes influenced by CPC+?		
	% Yes	Not at all influenced	Influenced somewhat	Strongly influenced
Increased the amount of funding provided to primary care practices to support practice transformation	45	32	45	23
Increased the proportion of payments paid *prospectively* (for example, through comprehensive primary care payments or full or partial capitated payments)	31	13	67	20
Increased the alignment of quality metrics used for calculating payments	71	37	46	17
Provided more comprehensive data feedback (such as adding additional measures or new drill-down features to reports)	63	29	58	13
Provided additional technical assistance or practice coaching to practices	51	29	54	17
Some other change	3	n.a	n.a	n.a
N	49	--	--	--

Source: Mathematica's analysis of the independent evaluation's PY 4 CPC+ Payer Survey.

Note: n = number of payers that selected each response option to the question; N = total number of respondents. n.a. = not applicable.

This page has been left blank for double-sided copying.

Mathematica
Progress Together

FOR REFERENCE ONLY
PLEASE COMPLETE WEB VERSION

2020 WEB SURVEY FOR PAYERS PARTICIPATING IN CPC+

Welcome to the Payer Survey for the independent evaluation of Comprehensive Primary Care Plus (CPC+)! We appreciate you taking the time to complete the survey. Your input will help us understand the critical supports your organization is providing CPC+ practices.

If you have questions about this survey, please contact Brianna Sullivan at Mathematica (BSullivan@mathematica-mpr.com or 671-715-9953).

INTRODUCTION

Thank you again for completing Mathematica's CPC+ payer survey in 2019! Your participation in this 2020 survey will help us understand what has and has not changed about the supports you provide to CPC+ practices in 2020.

[FOR MULTI-REGION PAYERS WITH MULTIPLE RESPONDENTS: We understand that [PAYER]'s approach to supporting practices is different across CPC+ regions. You are receiving this survey because you were selected by [PAYER] to complete this survey specifically for [REGION SURVEY IS ASKING ABOUT].]

Most of the questions in the 2020 survey are the same as the questions in the 2019 survey. To reduce reporting burden, we have retained your 2019 responses in the 2020 survey. You will have the opportunity to review those responses and, if your approach has changed, to update your answer to reflect your new approach.

The 2020 survey will cover six topics:

NEW: How the COVID-19 pandemic may have impacted your payment approaches

A. Details of payer participation in CPC+

B. Payer's approach to CPC+ payments

C. Payer's approach to data feedback and learning support to practices

D. How supports for primary care practices may have changed since partnering in CPC+

E. NEW: Your thoughts on the forthcoming Primary Care First (PCF) model

Please make sure to fill out the questions in the two new survey sections.

Mathematica and the Centers for Medicare & Medicaid Services (CMS) regularly collect information from payers in CPC+ to track the model's progress and aid in its evaluation. To further reduce reporting burden on payers, Mathematica and CMS are working to align their data collection efforts for 2020.

We plan to share the information you provide in this survey with CMS. Neither Mathematica nor CMS will share your answers with any other payer, nor with any practice participating in CPC+. If you prefer for all or some information to not be shared with CMS, you will have the opportunity to indicate this preference at the end of the survey.

To help us understand the details of your CPC+ participation, please fill out the 2020 Payer Survey. Your insights will help CMS better understand the role that non-Medicare payers play in practice and payment transformation and will guide CMS' design of initiatives in the future. Mathematica staff will also be conducting telephone interviews with a subset of CPC+ payers this fall. If you are selected to participate in an interview, a Mathematica staff member will reach out to you with additional details. For your reference, frequently asked questions (FAQs) related to the CPC+ Payer Survey can be found here.

IMPORTANT

- Most of the questions in the 2020 survey are the same as the questions in the 2019 survey. To reduce reporting burden, we have retained your 2019 responses in the 2020 survey. You will have the opportunity to review those responses and, if your approach has changed, to update your answer to reflect your new approach.
- The survey also includes a few new questions. Those questions will be clearly indicated as new and we ask that you provide responses to these questions.

INSTRUCTIONS TO COMPLETE THE SURVEY

- The survey works best on a desktop computer, and is best viewed in the latest versions of Chrome, Safari, Firefox, or Internet Explorer (IE 11 or Edge).
- If you answer "Other" for a question, please specify by typing what you mean in the "Specify" box.
- Click on "Back" at the bottom of the screen to go back to a previous question.
- Use the "Next" button to proceed to the next question. Your answers are saved each time you click the "Next" button.
- You do not have to complete the survey all at once. Be sure to click the "Next" button to save your answers before exiting the survey. You will resume at the next unanswered question when you return to the survey.
- After about 20 minutes of idle time, the survey may time out, but your answers will be saved. If that happens, you will be redirected to the login page prior to resuming the survey where you left off.
- If you have any questions while taking the survey, please click on "FAQ" at the bottom of the screen at any time. If the FAQ document does not answer your question, you may email Brianna Sullivan at BSullivan@mathematica-mpr.com.
- Once you have completed the survey, you will have the opportunity to review and/or print your answers before submitting the survey. Please note that once you submit the survey, you cannot go back in to change your answers.
- Instructions to submit the survey when you have finished answering all of the questions are listed after the last survey question.

Before we start the survey, please provide the following contact information for the person completing this survey:

Please update this information if no longer correct.

Payer Organization:	
Name:	
Title:	
Email Address:	
Telephone:	

COVID-19

We are interested in understanding how the COVID-19 pandemic may have affected your 2020 payment policies for **all of the primary care practices with which you contract, regardless of whether they participate in CPC+.** We are only asking about your fully insured lines of business, not your commercial self-insured products.

If your payment approaches differ between lines of business, please answer each question for the most common approach across your lines of business, or the approach for your largest line of business. At the end of this section you will have the opportunity to describe any differences by line of business.

NEW

1. Is your organization waiving patient cost-sharing <u>for treatment of COVID-19</u>? Please note this question is asking about COVID-19 treatment only, not COVID-19 testing.

Select one only

- ❍ Yes, **all** patient cost-sharing for COVID-19 treatment is being waived 1
- ❍ Yes, **some** patient cost-sharing for COVID-19 treatment is being waived or reduced 2
- ❍ No, all standard patient cost-sharing for COVID-19 treatment **still applies** 3
- ❍ No **waivers necessary**; our coverage prior to the COVID-19 pandemic did not require patient cost-sharing for treatments like those for COVID-19 4

NEW

2. During the COVID-19 pandemic, is your organization waiving patient cost-sharing <u>for primary care services provided via telehealth</u>? Please note, this question is asking about any primary care telehealth service, not just telehealth for COVID-19.

Select one only

- ❍ Yes, **all** patient cost-sharing for primary care telehealth is being waived 1
- ❍ Yes, **some** patient cost-sharing for primary care telehealth is being waived or reduced 2
- ❍ No, all standard patient cost-sharing for primary care telehealth **still applies as before** the COVID-19 pandemic 3
- ❍ **No waivers necessary;** our coverage prior to the COVID-19 pandemic did not require patient cost-sharing for primary care telehealth services 4

NEW

3. Please briefly describe any other changes your organization has made to your approach to <u>patient cost-sharing</u> during the COVID-19 pandemic.

NEW **4.** **Please indicate (1) if your organization is reimbursing for primary care practices or providers for any of the following primary care telehealth visits during the COVID-19 pandemic, and (2) whether this reimbursement approach is a change in response to COVID-19.**

	1. During the COVID-19 pandemic, is your organization reimbursing for…?	2. Is this approach a change due to COVID-19?
Telehealth services and provider types		
a. Telehealth visits conducted by **physicians (MD's and DO's)**	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
b. Telehealth visits conducted by **non-physician staff (NP's, PA's, or others)**	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
c. Telehealth **behavioral health visits** conducted by physicians or non-physician staff	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
Technology used		
d. Telehealth visits conducted via **HIPAA-compliant technology**	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
e. Telehealth visits conducted via non-HIPAA compliant technology (for example, **Skype, Zoom, Facetime, or comparable technologies)**	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
f. Telehealth visits conducted via **telephone**	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No

NEW **5.** **How does your reimbursement rate for primary care telehealth visits during the COVID-19 pandemic compare to your reimbursement rates for in-person visits?**

Select one only

❍ We reimburse all telehealth visits at rates **on par** with in-person visits 1

❍ We reimburse some, but not all, telehealth visits at rates **on par** with in-person visits 2

❍ We reimburse all of our telehealth visits at rates **lower than on par** with in-person visits 3

NEW **6.** **You said** [ANSWER TO PREVIOUS QUESTION: you reimburse all telehealth visits at rates on par with in-person visits/you reimburse some, but not all, telehealth visits at rates on par with in-person visits/you reimburse all of your telehealth visits at rates lower than on par with in-person visits]**.**

Is this approach a change due to COVID-19?

Select one only

❍ Yes 1

❍ No 2

NEW **7.** **Please briefly describe any other changes your organization has made to your approach to <u>reimbursing for primary care telehealth services and visits</u> during the COVID-19 pandemic.**

NEW **8.** **Is your organization providing any of the following temporary financial supports or interim payment programs to primary care practices or providers during the COVID-19 pandemic?**

Select all that apply

☐ Increased fee-for-service (FFS) payment rates 1

☐ Increased capitation payment rates 2

☐ Increased care management fee payment rates 3

☐ Providing accelerated payments of any kind to practices or providers (for example, providing care management fee payments ahead of schedule to help practices implement COVID-19 responses or ease cash flow problems)..... 4

☐ Postponing recoupment of funds owned by practices or providers 5

☐ Ease the requirements for practices or providers to earn performance-based payments (such as shared savings or bonus payments)..... 6

☐ Providing loans directly to practices or providers..... 7

☐ Providing loan guarantees, meaning loans that practices/providers receive from financial institutions that your organization is guaranteeing 8

☐ Providing grants directly to practices or providers 9

❍ No, we are not providing any financial supports to primary care practices or providers due to the COVID-19 pandemic 0

☐ Other (SPECIFY)..... 99

Specify

NEW **9.** **[ONLY ANSWER IF YOU OFFER TWO OR MORE LINES OF BUSINESS]**

Lastly, please use the space below to briefly describe any differences <u>across your lines of business</u> in your approach to COVID-19 cost sharing, reimbursement approaches, and/or financial supports for primary care practices or providers.

A. PAYER PARTNERSHIP IN CPC+

In this section, we ask about the details of your CPC+ partnership in [REGION SURVEY IS ABOUT]. Specifically, we are interested in hearing about how you are contracting with CPC+ practices and your approach to attributing members to CPC+ practices.

A1. In 2020, did you offer the following line(s) of businesses in [REGION SURVEY IS ABOUT]?

Select one per row

		Yes	No
a.	Commercial: Fully Insured Products	1 ❍	0 ❍
b.	Commercial: Self-Insured Products (Third Party Administrator (TPA) / Administrative Services Only (ASO))	1 ❍	0 ❍
c.	Health Insurance Marketplace Plan(s)	1 ❍	0 ❍
d.	State/Federal High-Risk Pool(s)	1 ❍	0 ❍
e.	Medicare Advantage	1 ❍	0 ❍
f.	Medicaid/CHIP Managed Care Plan(s)	1 ❍	0 ❍
g.	Medicaid/CHIP fee-for-service (FFS)	1 ❍	0 ❍

A2. How do you attribute or assign members to CPC+ practices?

Select all that apply

☐ Members select or are assigned to a primary care provider (typically at enrollment) 1

☐ Members are attributed to a CPC+ practice using a claims-based attribution methodology 2

☐ Other (SPECIFY)..... 99

Specify ☐

[GO TO A8 IF OPTION 2 NOT SELECTED ABOVE]

A3. [ONLY ANSWER IF USING CLAIMS-BASED ATTRIBUTION METHODOLOGY (A2=2)]

How many months do you use for the look back period to attribute members to CPC+ practices? If you have a primary and a secondary look back period, please indicate both.

☐ Number of months in look back period (1-48 months)

☐ Number of months in secondary look back period (if no visits during primary look back period) (0-48 months)

A4. **[ONLY ANSWER IF USING CLAIMS-BASED ATTRIBUTION METHODOLOGY (A2=2)]**

What is your primary claims-based attribution methodology?

- ❍ Members are attributed to the primary care practice they visited most frequently during the look back period (i.e., plurality of visits) 1
- ❍ Members are attributed to the primary care practice they last visited during the look back period 2
- ❍ Other (SPECIFY) 99

Specify ☐

A5. **[ONLY ANSWER IF USING CLAIMS-BASED ATTRIBUTION METHODOLOGY (A2=2)]**

How frequently do you rerun CPC+ attribution?

- ❍ Monthly 1
- ❍ Quarterly 2
- ❍ Twice a year 3
- ❍ Yearly 4
- ❍ Other (SPECIFY) 99

Specify ☐

A6. **[ONLY ANSWER IF USING CLAIMS-BASED ATTRIBUTION METHODOLOGY (A2=2)]**

Can CPC+ practices appeal attribution of certain members? In other words, can practices request that a patient that is not attributed be attributed, or vice versa?

- ❍ Yes 1
- ❍ No 0

A8. **[ONLY ANSWER IF OFFERING COMMERCIAL SELF-INSURED (TPA OR ASO) LINE OF BUSINESS (A1b=1)]**

How many of your commercial self-insured (TPA/ASO) clients in [REGION SURVEY IS ABOUT] participate in CPC+?

- ❍ All commercial self-insured clients 3
- ❍ Most commercial self-insured clients 2
- ❍ Some commercial self-insured clients 1
- ❍ No commercial self-insured clients 0

A9. **[ONLY ANSWER IF OFFER COMMERCIAL SELF-INSURED (TPA OR ASO) LINE OF BUSINESS (A1b=1)]**

Please select the option that best describes your strategy for recruiting commercially self-insured (TPA/ASO) clients to participate in CPC+.

- ❍ All commercial self-insured clients are **required** to participate in CPC+ 1
- ❍ Commercial self-insured clients are enrolled in CPC+ unless they **opt out** of participation 2
- ❍ Commercial self-insured clients can **opt in** to CPC+ participation 3

A10. **If relevant, use the space below to note any differences in your approach to CPC+ contracting, attribution, or self-insured participation across CPC+ regions.**

B. PAYMENT APPROACHES FOR CPC+

In this section, we are interested in learning about your 2020 payment approaches for primary care practices.

B1. For each of the following payment approaches, please indicate if (1) you are using the payment approach for any primary care practices in [REGION SURVEY IS ABOUT] in 2020, and (2) if you plan to use the payment approach for any practices in 2021.

These payment approaches could be used for CPC+ and/or for other programs that you have in place to support primary care practices.

Payment Approach	1. Using approach in **2020**?	2. Plan to use approach in **2021**?
a. **Care management fees.** Care management fees are non-visit based PMPM payments to primary care practices to support enhanced, coordinated services. These fees are paid in addition to usual payments for services. This fee may be risk-adjusted. (For capitated payments made for services in lieu of FFS select "e.")	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
b. **Performance-based incentive payments or pay for performance.** ***(Note: This category is separate from shared savings.)*** Bonus payments and/or payment recoupments used to incentivize practices to meet benchmarks (for example, on utilization, cost, or quality). These payments can be made prospectively or at the end of the performance period.	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
c. **Shared savings model.** Payers calculate savings on total cost of care or on cost of a subset of services (such as a primary-care focused episode of care), which are compared to an expenditure target or to costs for another group. A proportion of savings (or losses) are shared with (or recouped from) practices/groups. These payments or withholds are made retrospectively.	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
d. **Enhanced fee-for-service (FFS) payments.** Payer pays practices an enhanced FFS payment rate (for example, 105% of normal FFS rates) to support enhanced, coordinated services and/or for meeting benchmarks (for example, on utilization, cost, or quality) during the prior year.	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
e. **Comprehensive Primary Care Payments or Capitation (partial or full) or Global Payments.** Practices receive lump sum payments for attributed patients in lieu of all or some portion of FFS payments. FFS payments for primary care services are correspondingly reduced or eliminated.	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
f. **Prospective bundled payments for primary-care focused episodes of care.** Payer determines a target price for a primary-care focused episode of care. Payers pay that lump sum prospectively (eliminating or reducing FFS payments for that episode of care).	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No
g. Other (SPECIFY)	1 ❍ Yes 0 ❍ No	1 ❍ Yes 0 ❍ No

B2. If relevant, use the space below to note any differences in the type of payment approaches you use across CPC+ regions.

Care Management Fees

[THIS SECTION ASKED ONLY IF PAYER IS USING CMF APPROACH IN 2020 (B1a1=YES)]

The next set of questions will focus on your care management fees. Care management fees are non-visit based PMPM payments to practices to support enhanced, coordinated services. This fee may be adjusted but is not dependent on utilization, cost, or quality measures. Please focus on how you are paying the CPC+ practices you contract with during 2020.

B3. For a given practice type, please indicate how many practices receive care management fees.

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	❍ 0	❍ 1	❍ 2	❍ 3
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	❍ 0	❍ 1	❍ 2	❍ 3
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	❍ 0	❍ 1	❍ 2	❍ 3

[IF ANSWER NO TO ALL B3a-c QUESTIONS, PLEASE GO TO PERFORMANCE-BASED INCENTIVE PAYMENT SECTION ON PAGE 21, QUESTION B22]

B4. In which regions are you providing care management fees to practices that are NOT participating in CPC+ in 2020?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

The remaining questions in this section focus on your approach in all of your CPC+ regions.

For these next questions about care management fees:

- **Please focus on your approach for your CPC+ practices, not your approach for other primary care practices that are not participating in CPC+.**
- **Unless otherwise specified, please focus on the approach used most commonly with your CPC+ practices, even if you have different approaches for Track 1 and Track 2.**

B6. In 2020, for which line(s) of business are you offering CPC+ care management fees?

Select all that apply

- ☐ Commercial: Fully Insured Products 1
- ☐ Commercial: Self-Insured Products (TPA/ASO) 4
- ☐ Health Insurance Marketplace Plan(s) 2
- ☐ State/Federal High-Risk Pool(s) 3
- ☐ Medicare Advantage 5
- ☐ Medicaid/CHIP Managed Care Plan(s) 6
- ☐ Medicaid/CHIP fee-for-service (FFS) 7

B7. [ONLY ANSWER IF YOU ARE OFFERING CMFS TO MORE THAN ONE LINE OF BUSINESS]

Do your 2020 care management fees for CPC+ practices differ by line of business?

- ❍ Yes 1
- ❍ No 0

B8. Do you adjust your care management fees based on any patient factors such as demographics, patient risk score, patient category, or patient health status?

- ❍ Yes 1
- ❍ No 0

B9. [ONLY ANSWER IF YOU ADJUST YOUR CARE MANAGEMENT FEES BASED ON PATIENT FACTORS (B8=1)]

What patient factors do you use to adjust your care management fees?

Select all that apply

- ☐ Adjust for demographic characteristics (such as age or sex) 1
- ☐ Adjust for patient risk score (such as Hierarchical Condition Category [HCC] risk score, 3M Clinical Risk Groups [CRG], Milliman Advanced Risk Adjusters [MARA], or DxCG) 2
- ☐ Adjust for patients' prior cost or service use 3
- ☐ Other (SPECIFY) 99

Specify ☐

B10. As you may know, CMS sets requirements that practices must meet to participate in CPC+.

In addition to these CPC+ requirements, do you use any factors tied to practice or practitioner performance – such as utilization, cost, or quality metrics, or accreditation standards such as Patient-Centered Medical Home (PCMH) participation – to determine:

Select all that apply

☐ If practices are **eligible** to receive any care management fees? (e.g., you set a quality floor for receiving any care management fees) 1

☐ The **amount** of care management fees a practice may receive? (e.g., better performance equals higher fees) 2

❍ None of the above. Care management fees are not tied to any practice performance factors. 0

B11. [ONLY ANSWER IF CMFS ARE TIED TO PRACTICE PERFORMANCE FACTORS (B10=1 OR 2)]

Please indicate below which practice metrics or accreditation standards you use to [1) determine practice eligibility to receive care management fees and/or 2) adjust the specific care management fee amount a practice receives].

Metric or standard	Used to determine practice **eligibility** to receive care management fees?	Used to adjust the specific care management **fee amount** a practice receives?
a. Practice performance on utilization metrics	☐	☐
b. Practice performance on cost metrics	☐	☐
c. Practice performance on quality metrics	☐	☐
d. Achieving Patient-Centered Medical Home (PCMH) recognition or by PCMH tier	☐	☐
e. Other (SPECIFY) _____	☐	☐

B12. **[ONLY ANSWER IF YOU INDICATED YOU USE ANY METRIC OR STANDARD IN B11 TO ADJUST THE SPECIFIC FEE AMOUNT]**

You indicated that you adjust the specific care management fee amount a practice receives based on the following practice performance factors:

- **Practice performance on utilization metrics**
- **Practice performance on cost metrics**
- **Practice performance on quality metrics**
- **Achieving Patient-Centered Medical Home (PCMH) recognition or by PCMH tier**
- **Other**

For a typical CPC+ practice, what percent of your 2020 care management fees are dependent on these factors?

[ ] PERCENT (RANGE 0 to 100)

NEW

B.12.b. **[ONLY ANSWER IF CMFS ARE ADJUSTED BASED ON PATIENT FACTORS (B8=1) OR IF FACTORS ARE USED TO DETERMINE THE AMOUNT OF CMFS A PRACTICE MAY RECEIVE (B10=2).**

How did you adjust the PMPM care management payments provided to your Track 1 CPC+ practices in 2020?

❍ Tiers or categories..... 1

❍ Continuous values 2

B13. **[ONLY ANSWER IF YOUR TRACK 1 PRACTICES RECEIVE CMFS (B3a=1, 2, OR 3) AND IF YOU DO NOT USE CONTINUOUS VALUES TO ADJUST THE PMPM CARE MANAGEMENT PAYMENTS TO TRACK 1 PRACTICES (B12b=NOT 2)]**

This question is about the 2020 care management fees for your Track 1 CPC+ practices.

For [your care management fees/ other LOBs chosen in B6]…

What is the average per member per month (PMPM) care management payment for your Track 1 practices in 2020?

Do NOT include performance-based incentive payments.

$ [ ] Average PMPM payment (RANGE 0-50)

B14. **[ONLY ANSWER IF YOUR TRACK 1 PRACTICES RECEIVE CMFS (B3a=1, 2, OR 3) AND YOU ADJUST YOUR CMF PAYMENTS AND YOU DO NOT USE CONTINUOUS VALUES TO ADJUST THE PMPM CARE MANAGEMENT PAYMENTS TO TRACK 1 PRACTICES (B12b=NOT 2)]**

What is the adjusted Track 1 PMPM care management payment for each tier [for CYCLE THROUGH EACH LINE OF BUSINESS SELECTED AT B6]?

Use only the number of tiers that are applicable for your organization.

Tier 1: $ _____ PMPM payment (RANGE 0-50)

Tier 2: $ _____ PMPM payment (RANGE 0-50)

Tier 3: $ _____ PMPM payment (RANGE 0-50)

Tier 4: $ _____ PMPM payment (RANGE 0-50)

Tier 5: $ _____ PMPM payment (RANGE 0-50)

Please note, you will be asked items B13 and B14 for each line of business you selected at item B6

NEW **B14.b.** **[ONLY ANSWER IF YOUR TRACK 1 PRACTICES RECEIVE CMFS (B3a=1, 2, OR 3) AND YOU ADJUST YOUR CMF PAYMENTS AND IF YOU ADJUST THE PMPM CARE MANAGEMENT PAYMENTS TO TRACK 1 PRACTICES USING CONTINUOUS VALUES (B12b=2)]**

What are the adjusted average and range of values of your Track 1 PMPM care management payments[for CYCLE THROUGH EACH LINE OF BUSINESS SELECTED AT B6]?

Average: $ _____

Range: Minimum $ _____ ; Maximum $ _____

B15. **[ONLY ANSWER IF YOU HAVE BOTH TRACK 1 AND TRACK 2 PRACTICES THAT RECEIVE CMFS (B3a=1, 2, or 3 AND B3b=1, 2, or 3]**

Please confirm whether your 2020 care management fees are different for Track 1 and Track 2 CPC+ practices.

❍ Yes, they are different 1

❍ No, they are the same 0

B16. **[ONLY ANSWER IF YOUR TRACK 2 PRACTICES RECEIVE CMFS (B3b=1, 2, OR 3) AND PAYMENTS RECEIVED BY TRACK 2 PRACTICES ARE DIFFERENT THAN TRACK 1 (B15=1)]**

This question is about the 2020 care management fees for your Track 2 CPC+ practices.

For [your care management fees/CYCLE THROUGH EACHLINE OF BUSINESS SELECTED IN B6]…

What is the average per member per month (PMPM) care management payment for your Track 2 practices in 2020?

Do NOT include performance-based incentive payments.

$ ☐ Average PMPM payment (RANGE 0-50)

B17. **[ONLY ANSWER IF YOUR TRACK 2 PRACTICES RECEIVE CMFS (B3b=1, 2, or 3), PAYMENTS RECEIVED BY TRACK 2 PRACTICES ARE DIFFERENT THAN TRACK 1 (B15=1), AND YOU ADJUST YOUR CMF PAYMENTS AND YOU DO NOT USE CONTINUOUS VALUES TO ADJUST THE PMPM CARE MANAGEMENT PAYMENTS TO TRACK 1 PRACTICES (B12b=NOT 2)]**

What is the adjusted Track 2 PMPM care management payment for each tier for [CYCLE THROUGH EACH LINE OF BUSINESS SELECTED IN B6]?

Use only the number of tiers that are applicable for your organization.

Tier 1: $ ☐ PMPM payment (RANGE 0-50)

Tier 2: $ ☐ PMPM payment (RANGE 0-50)

Tier 3: $ ☐ PMPM payment (RANGE 0-50)

Tier 4: $ ☐ PMPM payment (RANGE 0-50)

Tier 5: $ ☐ PMPM payment (RANGE 0-50)

B17.b. **[ONLY ANSWER IF YOUR TRACK 2 PRACTICES RECEIVE CMFS (B3b=1, 2, or 3), PAYMENTS RECEIVED BY TRACK 2 PRACTICES ARE DIFFERENT THAN TRACK 1 (B15=1), AND YOU ADJUST THE PMPM CARE MANAGEMENT PAYMENTS TO TRACK 2 PRACTICES USING CONTINUOUS VALUES (B12b=2)]**

What are the adjusted average and range of values of your Track 2 PMPM care management payments[for CYCLE THROUGH EACH LINE OF BUSINESS SELECTED IN B6]?

Average: $ ☐

Range: Minimum $ ☐ ; Maximum $ ☐

B18. **Do you impose any restrictions on how practices can use the CPC+ care management fees you provide them?**

❍ Yes 1

❍ No 0

B19. **[ONLY ANSWER IF YOU IMPOSE RESTRICTIONS ON HOW PRACTICES CAN USE CMFS (B18=1)]**

Below, we list the types of expenses CMS does *NOT* allow practices to spend Medicare FFS care management fees on. Please check the expenses practices are *NOT* allowed to spend your CPC+ care management fees on.

Select all that apply

- ○ Our restrictions are identical to CMS 0
- ☐ Bonus payments to primary care practitioners or staff 1
- ☐ Payments to specialists 2
- ☐ Contracted services without practice oversight, such as from a care management company 3
- ☐ Health information technology 4
- ☐ Fees for accreditation 5
- ☐ Durable medical equipment 6
- ☐ Diagnostic and imaging equipment 7
- ☐ Medications 8
- ☐ Practitioner or staff training or continuing medical education credits 9
- ☐ Income and business tax payments 10
- ☐ Other (SPECIFY) 99

Specify ☐

B20. **If relevant, use the space below to note any differences in your approach to CPC+ care management fees across CPC+ regions.**

☐

B21. **[ONLY ANSWER IF YOU ARE PROVIDING CMFS TO NON-CPC+ PRACTICES (B3c=1, 2, OR 3)]**

You indicated earlier that [some/most/all] non-CPC+ practices receive care management fees. How do your care management fee payment levels for those practices compare to your payments for Track 1 CPC+ practices?

- ❍ Payments under other programs are generally higher than CPC+ payments for Track 1 1
- ❍ Payments under other programs are about the same as CPC+ payments for Track 1 2
- ❍ Payments under other programs are generally lower than CPC+ payments for Track 1 3

Performance-Based Incentive Payments

[COMPLETE THIS SECTION IF PERFORMANCE-BASED INCENTIVE PAYMENTS OR PAY FOR PERFORMANCE WAS SELECTED IN B1 FOR 2020]

The next set of questions will focus on your performance-based incentive payments for primary care practices. Performance-based incentive payments or pay-for-performance programs include bonus payments and/or payment recoupments used to incentivize practices to meet benchmarks (for example, on utilization, cost or quality). These payments can be made prospectively or at the end of the performance period. Please focus on how you are rewarding practices during 2020.

B22. For a given practice type, please indicate how many practices are potentially eligible to receive performance-based incentive payments. Please note that for this survey "CPC+ practices" refer to practices that were selected by CMS to participate in CPC+.

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

[IF NONE SELECTED FOR A, B, AND C, SKIP TO B33 ON PAGE 24 (SHARED SAVINGS SECTION)]

B23. In which regions are practices that are NOT participating in CPC+ eligible for performance-based incentive payments?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

The remaining questions in this section focus on your approach in all of your CPC+ regions.

B24. In 2020, for which line(s) of business are you offering CPC+ performance-based incentive payments?

Select all that apply

- ☐ Commercial: Fully Insured Products Insurance Plan(s) 1
- ☐ Commercial: Self-Insured Products (TPA/ASO) 4
- ☐ Health Insurance Marketplace Plan(s) 2
- ☐ State/Federal High-Risk Pool(s) 3
- ☐ Medicare Advantage 5
- ☐ Medicaid/CHIP Managed Care Plan(s) 6
- ☐ Medicaid/CHIP fee-for-service (FFS) 7

B25. **[ONLY ANSWER IF PROVIDING PBIPS TO MULTIPLE TYPES OF PRACTICES (TRACK 1, TRACK 2, AND/OR OTHER PRIMARY CARE PRACTICES NOT PARTICIPATING IN CPC+)]**

You have indicated that you provide performance-based incentive payments [Track 1 CPC+ practices / Track 2 CPC+ practices / other primary care practices that are not participating in CPC+/multiple lines of business]. Do you have a different approach to providing performance-based incentive payments for:

Select one per row

		Yes	No
a.	CPC+ practices versus other primary care practices that are not participating in CPC+ practices?	1 ❍	0 ❍
b.	Track 1 CPC+ practices versus Track 2 CPC+?	1 ❍	0 ❍
c.	Different lines of business?	1 ❍	0 ❍

For these next questions about performance-based incentive payments:

- Please focus on your approach for **your CPC+ practices,** not your approach for other primary care practices that are not participating in CPC+.
- Unless otherwise specified, please focus on **the approach used most commonly with your CPC+ practices,** not your separate approaches for Track 1 and Track 2 practices.
- Please think about **your line of business with the greatest number of patients attributed to CPC+ practices.**

B26. **/ PBIP_PRO [Performance-Based Incentive Payments]**

In 2020, are you providing upfront performance-based incentive payments to CPC+ practices?

❍ Yes, practices receive an upfront, prospective incentive payment (e.g., bonus) that is later reconciled based on their performance..... 1

❍ No, we pay these payments at the end of a performance period. 0

B27. **[ONLY ANSWER IF YOU ARE PROVIDING UPFRONT PERFORMANCE-BASED INCENTIVE PAYMENTS (B26=1)]**

Will practices be subject to a payment recoupment the following year if they do not meet prespecified quality or efficiency benchmarks?

❍ Yes 1

❍ No 0

B28. **Have you finalized your performance-based incentive payment calculations based on practices' performance in 2018?**

❍ Yes 1

❍ No 0

B29. **[ONLY ANSWER IF YOU HAVE FINALIZED YOUR PBIP CALCULATIONS (B28=1)]**

What proportion of practices qualified for performance-based incentive payments based on their performance in 2018?

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

B30. **Do you impose any restrictions on how practices can use the CPC+ performance-based incentive payments you provide them?**

❍ Yes 1

❍ No 0

B31. **[ONLY ANSWER IF YOU IMPOSE RESTRICTIONS ON HOW PRACTICES CAN SPEND THEIR PBIPS (B30=1)]**

What expenses are practices NOT allowed to spend CPC+ performance-based incentive payments on?

Select all that apply

☐ Bonus payments to primary care practitioners or staff 1

☐ Payments to specialists 2

☐ Contracted services without practice oversight, such as from a care management company 3

☐ Health information technology 4

☐ Fees for accreditation 5

☐ Durable medical equipment 6

☐ Diagnostic and imaging equipment 7

☐ Medications 8

☐ Practitioner or staff training or continuing medical education credits 9

☐ Income and business tax payments 10

☐ Other (SPECIFY) 99

Specify _____

B32. **If relevant, use the space below to note any differences in your approach to performance-based incentive payments across CPC+ regions.**

_____

Shared Savings Model

[COMPLETE THIS SECTION IF SHARED SAVINGS MODEL WAS SELECTED IN B.1 FOR 2020]

The next set of questions ask about your shared savings program. Shared savings models are gain (or risk) sharing arrangements in which costs of care for CPC+ practices are compared to an expenditure target or to costs for another group of practices and a proportion of any savings are shared with practices. Payers calculate savings on total cost of care or on cost of a subset of services, which are compared to an expenditure target or to costs for another group. A proportion of savings (or losses) are shared with (or recouped from) practices/groups. These payments or withholds are made retrospectively. Please focus on how you are analyzing savings accrued for 2020.

B33. For a given practice type, please indicate how many practices are participating in a shared savings program. Please note that for this survey "CPC+ practices" refers to practices that were selected by CMS to participate in CPC+.

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

[IF NONE SELECTED FOR A, B, AND C, SKIP TO B47 ON PAGE 28 (ENHANCED FFS SECTION)]

B34. In which regions are practices that are NOT participating in CPC+ eligible for shared savings payments?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

The remaining questions in this section focus on your approach in all of your CPC+ regions.

B35. In 2020, for which line(s) of business are you offering your shared savings program?

Select all that apply

- ☐ Commercial: Fully Insured Products 1
- ☐ Commercial: Self-Insured Products (TPA / ASO) 4
- ☐ Health Insurance Marketplace Plan(s) 2
- ☐ State/Federal High-Risk Pool(s) 3
- ☐ Medicare Advantage 5
- ☐ Medicaid/CHIP Managed Care Plan(s) 6
- ☐ Medicaid/CHIP fee-for-service (FFS) 7

B36. **[ONLY ANSWER IF YOU ARE PROVIDING SHARED SAVINGS TO MORE THAN 1 TYPE OF PRACTICE (TRACK 1, TRACK 2, AND/OR NON-CPC+ PRACTICES)]**

You have indicated that you provide shared savings to [Track 1 CPC+ practices / Track 2 CPC+ practices / other primary care practices that are not participating in CPC+/multiple lines of business]. Do you have a different approach to providing shared savings for:

Select one per row

	Yes	No
a. CPC+ practices versus other primary care practices that are not participating in CPC+ practices?	❍1	❍0
b. Track 1 CPC+ practices versus Track 2 CPC+?	❍1	❍0
c. Different lines of business?	❍1	❍0

For these next questions about shared savings payments:

- Please focus on your approach for **your CPC+ practices,** not your approach for other primary care practices that are not participating in CPC+.
- Unless otherwise specified, please focus on **the approach used most commonly with your CPC+ practices,** not your separate approaches for Track 1 and Track 2 practices.
- Please think about **your line of business with the greatest number of patients attributed to CPC+ practices.**

B37. **For 2020, what is the typical maximum percent of savings you would share with practices?**

PERCENT OF SAVINGS

B38. **In 2020, will you include downside risk sharing? In other words, will CPC+ practices also share in losses?**

❍ Yes 1

❍ No 0

B39. **[ONLY ANSWER IF YOU ARE INCLUDING DOWNSIDE RISK SHARING (B38=1)]**

For 2020, what is the maximum typical percent of losses would you pass on to practices?

PERCENT OF LOSSES

B40. **For 2020, do you use a minimum savings rate (that is, a threshold that must be surpassed before savings are shared with practices)?**

❍ Yes 1

❍ No 0

B41. **[ONLY ANSWER IF YOU USE A MINIMUM SAVINGS RATE (B40=1)]**

What is the minimum savings rate?

_____ PERCENT MINIMUM SAVINGS RATE

B42. **Have you finalized your shared savings calculations based on practices' performance in 2018?**

❍ Yes 1

❍ No 0

B43. **What proportion of practices received shared savings payments based on their performance in 2018?**

		Select one per row			
		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

B44. **Compared to 2019, did you make any other significant changes to your shared savings approach for 2020?**

❍ Yes 1

❍ No 0

B45. **[ONLY ANSWER IF YOU MADE SIGNIFICANT CHANGES TO YOUR SHARED SAVINGS APPROACH IN 2020 (B44=1)]**

Please briefly describe these other changes to your shared savings program for 2020.

_____

B46. **If relevant, use the space below to note any differences in your approach to shared savings across CPC+ regions.**

_____

Enhanced FFS Payments

[COMPLETE THIS SECTION IF ENHANCED FEE-FOR-SERVICE (FFS) PAYMENTS WAS SELECTED IN B1 FOR 2020]

The next set of questions will focus on your 2020 enhanced FFS payments. Under enhanced FFS payment programs, payers pay practices an enhanced FFS payment rate (e.g., 105% of normal FFS rates) to support enhanced, coordinated services and/or for meeting benchmarks (for example, on utilization, cost, or quality) during the prior year.

B47. For a given practice type, please indicate how many practices are potentially eligible to receive enhanced FFS payments. Please note that for this survey "CPC+ practices" refers to practices that were selected by CMS to participate in CPC+.

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

[IF NONE SELECTED FOR A, B, AND C, SKIP TO B57 ON PAGE 32 (ALTERNATIVE FEE-FOR-SERVICE SECTION)]

B48. In which regions are practices that are NOT participating in CPC+ potentially eligible for enhanced FFS payments?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

The remaining questions in this section focus on your approach in all of your CPC+ regions.

B49. In 2020, for which line(s) of business are you offering enhanced FFS payments?

Select all that apply

- ☐ Commercial: Fully Insured Products 1
- ☐ Commercial: Self-Insured Products (TSA/ASO) 4
- ☐ Health Insurance Marketplace Plan(s) 2
- ☐ State/Federal High-Risk Pool(s) 3
- ☐ Medicare Advantage 5
- ☐ Medicaid/CHIP Managed Care Plan(s) 6
- ☐ Medicaid/CHIP fee-for-service (FFS) 7

B50. **[ONLY ANSWER IF YOU ARE PROVIDING ENHANCED FFS PAYMENTS TO MULTIPLE TYPES OF PRACTICES (TRACK 1, TRACK 2, AND/OR PRIMARY CARE PRACTICES NOT PARTICIPATING IN CPC+)]**

You have indicated that you provide enhanced FFS payments to [Track 1 CPC+ practices / Track 2 CPC+ practices / other primary care practices that are not participating in CPC+/multiple lines of business]. Do you have a different approach to providing enhanced FFS payments for:

Select one per row

		Yes	No
a.	CPC+ practices versus other primary care practices that are not participating in CPC+ practices?	❍	❍
b.	Track 1 CPC+ practices versus Track 2 CPC+?	❍	❍
c.	Different lines of business?	❍	❍

For these next questions about enhanced FFS payments:

- Please focus on your approach for **your CPC+ practices,** not your approach for other primary care practices that are not participating in CPC+.
- Unless otherwise specified, please focus on **the approach used most commonly with your CPC+ practices,** not your separate approaches for Track 1 and Track 2 practices.
- Please think about **your line of business with the greatest number of patients attributed to CPC+ practices.**

B51. **Are you providing enhanced FFS payments in 2020 based on performance in CPC+ in 2018?**

❍ Yes 1

❍ No 0

B52. **In 2020, what adjustments (if any) are you making when calculating the enhanced FFS rate for practices?**

Select all that apply

☐ Adjust for practice participation in CPC+ or another practice transformation initiative 1

☐ Adjust for practice performance on utilization, cost, quality metrics 2

☐ Adjust rate by practice status as it relates to CPC+ Tracks (e.g., CPC+ Track 1 or Track 2) or tiers (e.g., achieving a certain PCMH recognition level) 3

○ None of the above. Adjusted rate negotiated with practices but is not tied to CPC+ participation or utilization, cost, or quality metrics 3

☐ Other (SPECIFY)..... 99

Specify ☐

B53. **[ONLY ANSWER IF YOU ARE ADJUSTING ENHANCED FFS BASED ON PRACTICE PARTICIPATION IN CPC+ (B52=1)]**

By how much are you adjusting the 2020 FFS rate for participation in CPC+ or another primary care transformation initiative?

PERCENT

B54. **[ONLY ANSWER IF YOU ARE ADJUSTING ENHANCED FFS FOR PRACTICE PERFORMANCE ON UTILIZATION, COST, OR QUALITY METRICS (B52=2)]**

By how much are you adjusting 2020 FFS payments for performance on utilization, cost, and/or quality metrics?

PERCENT

B55. **[ONLY ANSWER IF YOU ARE ADJUSTING ENHANCED FFS FOR PRACTICE PERFORMANCE UTILIZATION, COST, OR QUALITY METRICS (B52=2)]**

If you are using quality tiers, please describe below.

B56. **If relevant, use the space below to note any differences in your approach to enhanced FFS payments across CPC+ regions.**

Alternative to FFS Payments

[COMPLETE THIS SECTION IF COMPREHENSIVE PRIMARY CARE PAYMENTS OR CAPITATION OR BUNDLED PAYMENTS FOR PRIMARY CARE-FOCUSED EPISODES OF CARE WAS SELECTED IN B1 FOR 2020]

The next set of questions will focus on your alternative payment approach, such as comprehensive primary care payments (CPCP), partial or full capitation, or bundled payments for episodes. Under these models, practices receive lump sum payments for attributed patients instead of all or some portion of fee-for-service payments. Please focus on your alternative payments to practices during 2020.

B57. For a given practice type, please indicate how many practices are included in your alternative to FFS approach. Please note that for this survey "CPC+ practices" refers to practices that were selected by CMS to participate in CPC+.

Select one per row

		None	Some	Most	All
a.	Track 1 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
b.	Track 2 CPC+ in [REGION SURVEY IS ABOUT]	0 ❍	1 ❍	2 ❍	3 ❍
c.	Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+	0 ❍	1 ❍	2 ❍	3 ❍

[IF NONE SELECTED FOR A, B, AND C, SKIP TO C1A ON PAGE 38 (QUALITY MEASURES, DATA FEEDBACK, AND TECHNICAL ASSISTANCE SECTION]

B58. In which regions are practices that are NOT participating in CPC+ receiving alternative to FFS payments?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

The remaining questions in this section focus on your approach in all of your CPC+ regions.

B59. In 2020, for which line(s) of business are you using an alternative payment approach?

Select all that apply

- ☐ Commercial: Fully Insured Products 1
- ☐ Commercial: Self-Insured Products (TPA/ASO) 4
- ☐ Health Insurance Marketplace Plan(s) 2
- ☐ State/Federal High-Risk Pool(s) 3
- ☐ Medicare Advantage 5
- ☐ Medicaid/CHIP Managed Care Plan(s) 6
- ☐ Medicaid/CHIP fee-for-service (FFS) 7

B60. **[ONLY ANSWER IF YOU ARE PROVIDING ALTERNATIVE TO FFS PAYMENTS TO MULTIPLE TYPES OF PRACTICES (TRACK 1, TRACK 2, AND/OR NON-CPC+ PRACTICES NOT PARTICIPATING IN CPC+)]**

You have indicated that you provide alternative to FFS payments to [Track 1 CPC+ practices / Track 2 CPC+ practices / other primary care practices that are not participating in CPC+/multiple lines of business]. Do you have a different approach to providing alternative to FFS payments for:

Select one per row

		Yes	No
a.	CPC+ practices versus other primary care practices that are not participating in CPC+ practices?	1 ❍	0 ❍
b.	Track 1 CPC+ practices versus Track 2 CPC+	1 ❍	0 ❍
c.	Different lines of business?	1 ❍	0 ❍

For these next questions about alternative to FFS payments:

- Please focus on your approach for **your CPC+ practices,** not your approach for other primary care practices that are not participating in CPC+.
- Unless otherwise specified, please focus on t**he approach used most commonly with your CPC+ practices,** not your separate approaches for Track 1 and Track 2 practices.
- Please think about **your line of business with the greatest number of patients attributed to CPC+ practices.**

B61. **Do practices receive prospective, alternative payments instead of some or all FFS payments for…**

Select one only

❍ All primary care services with few exceptions (such as immunizations or screeners) 1

❍ Some primary care services (such as Evaluation and Management office visits or primary care specific episodes) 2

❍ No primary care services. We do not use an alternative to FFS payment approach (such as full or partial capitation, or bundled payments) for our CPC+ primary care practices 0

B62 **[ONLY ANSWER IF PRACTICES ARE RECEIVING PROSPECTIVE, ALTERNATIVE PAYMENTS FOR SOME PRIMARY CARE SERVICES (B61=2)]**

For what primary care specific episodes are practices receiving prospective, alternative payments instead of some or all FFS payments?

Select all that apply

☐ Evaluation and Management office visits 1

☐ Primary care specific episodes (e.g., urinary tract infections, depression, low back pain) 2

☐ Other (SPECIFY) 99

Specify ☐

B63. **[ONLY ANSWER IF PRACTICES ARE RECEIVING PROSPECTIVE ALTERNATIVE PAYMENTS FOR PRIMARY CARE SPECIFIC EPISODES (B62=2)]**

In 2020, for what primary care specific episodes are practices receiving alternative or bundled payments?

Select all that apply

- ☐ Urinary tract infection 1
- ☐ Cellulitis 2
- ☐ HIV 3
- ☐ Hepatitis C 4
- ☐ Bronchiolitis and RSV pneumonia 5
- ☐ Hemophilia 6
- ☐ CAD and angina 7
- ☐ Sickle cell 8
- ☐ Hypotension 9
- ☐ Dermatitis/urticarial 10
- ☐ Upper respiratory infection (outpatient) 11
- ☐ Attention-deficit/hyperactivity disorder (ADHD) 12
- ☐ Oppositional defiant disorder (ODD) 13
- ☐ Otitis Media 14
- ☐ Depression 15
- ☐ Anxiety 16
- ☐ Headache 17
- ☐ Low back pain 18
- ☐ Asthma 19
- ☐ Chronic obstructive pulmonary disease (COPD) 20
- ☐ Perinatal care 21
- ☐ Other (SPECIFY) 99

Specify ☐

B64. In 2020, what adjustments (if any) are you making when calculating alternative payment amounts for CPC+ practices?

Select all that apply

- ☐ Adjust for practice participation in CPC+ or another practice transformation initiative 1
- ☐ Adjust for practice performance on utilization, cost, or quality metrics 2
- ☐ Adjust rate by practice status as it relates to CPC+ Tracks (e.g., CPC+ Track 1 or Track 2) or tiers (e.g., achieving a certain PCMH recognition level) 3
- ☐ Adjust for patient demographic characteristics (such as age/sex) 4
- ☐ Adjust for patient or population risk (such as HCC risk score) 5
- ☐ Other (SPECIFY) 99

Specify ☐

- ❍ None 6

B65. [ONLY ANSWER IF ADJUSTING ALTERNATIVE PAYMENTS FOR ELIGIBLE PRACTICES BASED ON PARTICIPATION IN CPC+ OR ANOTHER PRIMARY CARE TRANSFORMATION INITIATIVE]

What is the maximum adjustment amount for 2020 alternative payments based on participation in CPC+ or another primary care transformation initiative ?

☐ PERCENT

B66. [ONLY ANSWER IF ADJUSTING ALTERNATIVE PAYMENTS FOR ELIGIBLE PRACTICES BASED ON UTILIZATION, COST, OR QUALITY METRICS]

What is the maximum adjustment amount for 2020 alternative payments based on utilization, cost, or quality metrics?

☐ PERCENT

B67. [ONLY ANSWER IF ADJUSTING ALTERNATIVE PAYMENTS FOR ELIGIBLE PRACTICES BASED ON PRACTICES' TRACKS OR TIERS]

What is the maximum adjustment amount for 2020 alternative payments based on practices' Tracks or tiers (e.g., Track 1 and Track 2 for CPC+ or achieving a PCMH recognition level)?

☐ PERCENT

B68. [ONLY ANSWER IF ADJUSTING ALTERNATIVE PAYMENTS FOR ELIGIBLE PRACTICES BASED ON PRACTICES' TRACKS OR TIERS]

If you are using quality tiers, please describe below.

☐

B69. We want to understand the percentage of payments to primary care practices that are paid through FFS versus an alternative to FFS payment approach.

Thinking of the payments made to a typical primary care practice during the period from January – June 2020, please estimate the percentage of these payments that was paid using (1) FFS and (2) an alternative payment approach. Examples of alternative to FFS payments include prospective comprehensive primary care payments, capitated payments, and bundled payments for episodes of care.

	OF JANUARY – JUNE 2020 PAYMENTS TO PRIMARY CARE PRACTICES, APPROXIMATE PERCENT PAID USING	
	1. **FFS (%)**	2. **An alternative to FFS payment approach (%)**
a. Track 1 CPC+ practices in [REGION SURVEY IS ABOUT]		
b. Track 2 CPC+ practices in [REGION SURVEY IS ABOUT]		
c. Other primary care practices in [REGION SURVEY IS ABOUT] that are NOT participating in CPC+		

C. QUALITY MEASURES, DATA FEEDBACK, AND TECHNICAL ASSISTANCE

C1a. In 2020, are you using these metrics to calculate primary care payments? These metrics could be used to calculate care management fees, performance-based payments, shared savings payments, and/or enhanced FFS or capitation rates.

Select one per row

		Yes	No
a.	Claims-based cost and utilization measures	1 ❍	0 ❍
b.	Average cost for primary care specific episodes (e.g., urinary tract infections, depression, low back pain)	1 ❍	0 ❍
c.	Claims-based quality measures	1 ❍	0 ❍
d.	Electronic Clinical Quality Measures (eCQMs)	1 ❍	0 ❍
e.	Patient experience measures (e.g., CAHPS)	1 ❍	0 ❍
f.	Other (SPECIFY)	1 ❍	0 ❍
		1 ❍	0 ❍

C1b. [ANSWER ONLY FOR ROWS THAT YOU ANSWERED "YES" IN C1a]

Do you risk-adjust any of the following metrics?

Select one per row

		Yes	No
a.	Claims-based cost and utilization measures	1 ❍	0 ❍
b.	Average cost for primary care specific episodes (e.g., urinary tract infections, depression, low back pain)	1 ❍	0 ❍
C	Claims-based quality measures	1 ❍	0 ❍
d.	Electronic Clinical Quality Measures (eCQMs)	1 ❍	0 ❍
e.	Patient experience measures (e.g., CAHPS)	1 ❍	0 ❍
f.	[OTHER SPECIFY FROM C1a IF SELECTED]	1 ❍	0 ❍

C1c. **[ONLY ANSWER IF YOU USE PRIMARY CARE SPECIFIC EPISODES TO CALCULATE PRIMARY CARE PAYMENTS (C1b.b=1)]**

In 2020, what primary care-specific episodes are you using to calculate the amount of CPC+ payments or to determine if practices qualify for performance-based incentive payments?

Select all that apply

- ☐ Urinary tract infection 1
- ☐ Cellulitis 2
- ☐ HIV 3
- ☐ Hepatitis C 4
- ☐ Bronchiolitis and RSV pneumonia 5
- ☐ Hemophilia 6
- ☐ CAD and angina 7
- ☐ Sickle cell 8
- ☐ Hypotension 9
- ☐ Dermatitis/urticarial 10
- ☐ Upper respiratory infection (outpatient) 11
- ☐ Attention-deficit/hyperactivity disorder (ADHD) 12
- ☐ Oppositional defiant disorder (ODD) 13
- ☐ Otitis Media 14
- ☐ Depression 15
- ☐ Anxiety 16
- ☐ Headache 17
- ☐ Low back pain 18
- ☐ Asthma 19
- ☐ Chronic obstructive pulmonary disease (COPD) 20
- ☐ Perinatal care 21
- ☐ Other (SPECIFY) 99

Specify ☐

C2. **Do you currently share data feedback on cost, use, and/or quality with primary care practices? Please select "Yes" if you provide feedback directly to practices or if you provide it through a data aggregator.**

Select one only

- ❍ Yes. 1
- ❍ No, but data feedback will be provided before the end of 2020 2
- ❍ No, data feedback will not be provided in 2020 3

C4. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

For 2020, what type of data [are/will be] included in your data feedback?

Select one per row

		Yes	No
a.	Claims-based cost and utilization measures	❍1	❍0
b.	Average cost for primary care specific episodes (e.g., urinary tract infections, depression, low back pain)	❍1	❍0
c.	Claims-based quality measures	❍1	❍0
d.	Electronic Clinical Quality Measures (eCQMs)	❍1	❍0
e.	Patient experience measures (e.g., CAHPS)	❍1	❍0
f.	Specialists cost data	❍1	❍0
g.	Hospital cost data	❍1	❍0
h.	Other (SPECIFY)	❍1	❍0

C5. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

How frequently [will/do] you provide data at the system, practice, practitioner, and patient levels?

Select one per row

		Never, data not provided at that level	Quarterly	Monthly	Weekly	Real-time	Other	(SPECIFY)
a.	System-level	❍1	❍2	❍3	❍4	❍5	❍6	
b.	Practice-level	❍1	❍2	❍3	❍4	❍5	❍6	
c.	Practitioner-	❍1	❍2	❍3	❍4	❍5	❍6	
d.	Patient-level	❍1	❍2	❍3	❍4	❍5	❍6	

C6a. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

What format [will/do] you use for sharing data feedback?

Select all that apply

- ☐ Static report 1
- ☐ Interactive data portal 2
- ☐ Other (SPECIFY) 99

Specify ☐

NEW **C6b.** **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

Does your method of sharing data feedback allow practices to export the data or receive a data dump to manipulate the data themselves?

- ❍ Yes 1
- ❍ No 0

C7. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

If relevant, use the space below to note any differences in your approach to data feedback across CPC+ regions.

☐

C8. **[ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2)]**

In 2020, how many practices that are NOT participating in CPC+ in [REGION SURVEY IS ABOUT] are receiving data feedback on their system, practice, practitioners, or patients?

- ❍ None 0
- ❍ Some 1
- ❍ Most 2
- ❍ All 3

C8a. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2) AND ARE PROVIDING DATA FEEDBACK TO NON-CPC+ PRACTICES (C8=1, 2, OR 3)]**

In which regions are practices that were NOT selected for CPC+ receiving data feedback?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

C9. **[ONLY ANSWER IF YOU CURRENTLY SHARE OR WILL SHARE DATA FEEDBACK IN 2020 (C2=1 OR 2) AND ARE PROVIDING DATA FEEDBACK TO NON-CPC+ PRACTICES (C8=1, 2, OR 3)]**

How does your data feedback provided under other primary care programs compare to your data feedback for CPC+ practices?

Select one only

- ❍ Data feedback is more comprehensive than feedback provided to CPC+ practices 1
- ❍ Data feedback is about the same as feedback provided to CPC+ practices 2
- ❍ Data feedback is less comprehensive than feedback provided to CPC+ practices 3

C10. **Are you offering CPC+ practices technical assistance or practice coaching?**

- ❍ Yes 1
- ❍ No 0

C11. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE OR PRACTICE COACHING (C10=1)]**

In 2020, what type of assistance are you offering CPC+ practices?

Select all that apply

- ☐ In-person group learning sessions 1
- ☐ Web-based group learning sessions 2
- ☐ Individualized practice coaching 3
- ☐ Other 99

Specify ☐

C12. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE OR PRACTICE COACHING (C10=1)]**

Are you coordinating technical assistance for CPC+ practices with [YOUR REGIONAL LEARNING NETWORK]?

- ❍ Yes 1
- ❍ No 0

C12a. **[ONLY ANSWER IF COORDINATING TECHNICAL ASSISTANCE FOR CPC+ PRACTICES WITH YOUR REGIONAL LEARNING NETWORK (C12=1)]**

In which regions are you coordinating technical assistance with Regional Learning Networks?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

C13. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE OR PRACTICE COACHING (C10=1)]**

If relevant, use the space below to note any differences in your approach to technical assistance for practices across CPC+ regions.

C14. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE OR PRACTICE COACHING (C10=1)]**

In 2020, how many practices that are NOT participating in CPC+ are receiving technical assistance?

Select one only

- ❍ None 0
- ❍ Some 1
- ❍ Most 2
- ❍ All 3

C14a. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE TO NON-CPC+ PRACTICES IN OTHER PRIMARY CARE PROGRAMS (C14=1, 2, OR 3)]**

In which regions are practices that are NOT participating in CPC+ receiving technical assistance?

Select all that apply

- ☐ Arkansas 1
- ☐ Colorado 2
- ☐ Greater Buffalo Region (New York) 3
- ☐ Greater Kansas City 4
- ☐ Hawaii 5
- ☐ Louisiana 6
- ☐ Michigan 7
- ☐ Montana 8
- ☐ Nebraska 9
- ☐ New Jersey 10
- ☐ North Dakota 11
- ☐ North Hudson-Capital Region (New York) 12
- ☐ Ohio and Northern Kentucky 13
- ☐ Oklahoma 14
- ☐ Oregon 15
- ☐ Greater Philadelphia 16
- ☐ Rhode Island 17
- ☐ Tennessee 18

C15. **[ONLY ANSWER IF PROVIDING TECHNICAL ASSISTANCE TO NON-CPC+ PRACTICES IN OTHER PRIMARY CARE PROGRAMS (C14=1, 2, OR 3)]**

How does your technical assistance provided under other primary care programs compare to your technical assistance for CPC+ practices?

Select one only

- ❍ Technical assistance is more intensive than the support provided to CPC+ practices 1
- ❍ Technical assistance is about the same as the support provided to CPC+ practices 2
- ❍ Technical assistance is less intensive than the support provided to CPC+ practices 3

NEW **C16a.** **Some payers are offering other supports to practices or directly to CPC+ patients.**

Do you offer any of the following other supports or services to CPC+ practices?

Select all that apply

- ☐ Care managers for practices 1
- ☐ Practice coaching 6
- ☐ Social service supports (e.g., assessments and/or referral to social services agencies) 7
- ☐ Behavioral health integration supports (e.g., embedded behavioral health staff, reimbursement for behavioral health services provided in primary care settings) 2
- ☐ Embedded pharmacists for practices 3
- ☐ Fee for service reimbursement for alternative visits (such as home-based care, video-based conferencing, or e-visits) 4
- ☐ Other (SPECIFY) 99

Specify ☐

- ❍ None of the above 5

C16b. **[ONLY ANSWER IF PROVIDING FFS REIMBURSEMENT FOR ALTERNATIVE VISITS (C16a=4)]**

Do you provide FFS reimbursement to primary care practices for the following types of alternative visits?

Select all that apply

- ☐ Visits in alternative locations (for example, nursing facilities or senior centers) 1
- ☐ Home-based visits (i.e., primary care home visits) 2
- ☐ Medical group visits (i.e., shared medical appointments) 3
- ☐ Video-based conferencing (i.e., telehealth or telemedicine) 4
- ☐ Medical visit over an electronic exchange (for example, e-visit, portal) 5
- ☐ Medical visit via telephone (i.e. phone visit) 6
- ☐ Other (SPECIFY) 99

Specify ☐

NEW **C16c.** **Do you offer any of the following other supports or services directly to CPC+ attributed patients?**

Select all that apply

- ☐ Advance care planning 6
- ☐ Telephonic care management 1
- ☐ Medication therapy reviews 2
- ☐ Disease management programs 3
- ☐ Health and wellness services (e.g., smoking cessation counseling, weight loss support) 4
- ❍ None of the above 5

D. PRIOR AND CONCURRENT INITIATIVES

D1. We are interested in understanding how your supports for primary care practices may have changed in recent years.

Since deciding to partner in CPC+, 1) have you made any of the following changes to your primary care practice supports, and (2) if yes, how much were those changes influenced by partnering in CPC+?

	(1) Have you made any of the following changes to your supports for primary care practices since deciding to partner in CPC+?		(2) If yes, how much were those changes influenced by partnering in CPC+?		
	Yes (1)	No (2)	Not at all influenced (1)	Influenced somewhat (2)	Strongly influenced (3)
a. Increased the amount of funding provided to primary care practices to support practice transformation	❍1	❍0	❍1	❍2	❍3
b. Increased the proportion of payments paid *prospectively* (for example, through comprehensive primary care payments or full or partial capitated payments)	❍1	❍0	❍1	❍2	❍3
c. Increased the alignment of quality metrics used for calculating payments	❍1	❍0	❍1	❍2	❍3
d. Provided more comprehensive data feedback (such as adding additional measures or new drill down features to reports)	❍1	❍0	❍1	❍2	❍3
e. Provided additional technical assistance or practice coaching to practices	❍1	❍0	❍1	❍2	❍3
f. Some other change (SPECIFY)	❍1	❍0	❍1	❍2	❍3

D2. Please provide additional details on the changes that you made that were influenced by partnering in CPC+.

E. PRIMARY CARE FIRST

In 2021, CMS will begin offering Primary Care First (PCF), a five-year model designed to reward value and quality using an innovative payment method built from CMS' CPC+ model. CMS has invited payers to partner in the PCF model. As PCF partners, payers sign a memorandum of understanding with CMS, work with CMS to develop and implement an aligned payment approach, and work directly with practices and providers that are participating in the PCF model.

NEW **E1. Do you plan to partner with CMS in the Primary Care First (PCF) Model?**

Select one only

- ❍ Yes, planning to partner in PCF in **2021** 1
- ❍ Yes, planning to partner in PCF in **2022** 2
- ❍ Unsure, we are still considering whether to partner in PCF in 2022 3
- ❍ No, we have decided NOT to partner in PCF 4

NEW **E2. [ONLY ANSWER IF YOU HAVE DECIDED NOT TO PARTNER IN PCF (E1=4)]**

What are the primary reasons your organization decided not to partner in PCF?

Select all KEY reasons

Organizational factors

- ☐ My organization is prioritizing other value-based initiative(s) over PCF 1
- ☐ Concerns about lack of potential return on investment 2
- ☐ My organization experienced challenges in partnering with CMS during the CPC+ model PCF 3

PCF model factors

- ☐ PCF's model for moving away from fee-for-service reimbursement 4
- ☐ PCF's general focus on rewarding practices for outcomes instead of process measures 5
- ☐ The ***particular*** practice performance measures that PCF is using 6
- ☐ PCF's requirements for using data to drive practice accountability 7
- ☐ PCF's approach toward multi-payer collaboration and alignment 8

Practice factors

- ☐ Not enough practices in my region plan to participate in PCF 9
- ☐ Concerns about practices being able to make meaningful change to how they deliver care 10

Other factors

- ☐ Applied to PCF but was not accepted 11
- ☐ Other (Please describe) 99

Specify _____

NEW **E3.** **[ONLY ANSWER IF YOU ARE PLANNING TO PARTNER IN PCF IN 2021, 2022, OR ARE CONSIDERING PARTNERING]**

What is motivating your organization to [partner/consider partnering] in PCF?

Select all KEY motivations.

- ☐ PCF aligns with my organization's strategic objectives 1
- ☐ PCF aligns with primary care transformation efforts my organization is already pursuing 2
- ☐ PCF allows my organization to focus on high risk patients (e.g. patients with the most intensive medical needs)..... 3
- ☐ PCF allows my organization to be at the forefront of primary care transformation 4
- ☐ PCF allows my organization to focus on improving quality and outcomes..... 5
- ☐ PCF allows my organization to focus on lowering cost..... 6
- ☐ PCF allows my organization to partner collaborate with other payers (e.g., align provider incentives, decrease burden on providers) to reach a critical mass of patients in primary care practices 7
- ☐ Other (Please describe) 99

Specify ☐

NEW **E4.** **[ONLY ANSWER IF YOU ARE PLANNING TO PARTNER IN PCF IN 2022 OR ARE CONSIDERING PARTNERING]**

What are the key reasons your organization is [planning to partner/considering partnering] in PCF <u>in 2022 instead of 2021</u>?

Select all KEY reasons.

- ☐ My organization anticipates that more practices in our region will participate in 2022 than in 2021 1
- ☐ A 2022 start date better aligns with other ongoing priorities at my organization..... 2
- ☐ My organization first would like to see which other payers in my region partner in PCF 3
- ☐ My organization has concerns about aspects of PCF that we think will be addressed by 2022..... 4
- ☐ My organization would like more time to prepare for our partnership in PCF 5
- ☐ Uncertainty in the healthcare landscape (e.g., implications of the COVID-19 pandemic)..... 6
- ☐ Other (SPECIFY)..... 99

Specify ☐

NEW **E5.** **[ONLY ANSWER IF YOU ARE PLANNING TO PARTNER IN PCF IN 2021, 2022, OR ARE CONSIDERING PARTNERING]**

What challenges do you anticipate, if any, about [partnering/potentially partnering] in PCF?

Select all KEY challenges.

Practice factors

- ☐ Lack of readiness by practices to assume greater financial risk 1
- ☐ Practices' lack of data infrastructure to support movement away from fee-for-service reimbursement 2
- ☐ Not enough practices in my region plan to participate in PCF 3
- ☐ Concerns about practices' abilities to meet the needs of high-risk patients 4

PCF model factors

- ☐ PCF's model for moving away from fee-for-service reimbursement 5
- ☐ PCF's general focus on rewarding practices for outcomes instead of process measures 6
- ☐ The ***particular*** practice performance measures that PCF is using 7
- ☐ PCF's requirements for using data to drive practice accountability 8
- ☐ PCF's approach toward multi-payer collaboration and alignment 9

Organizational factors

- ☐ Conflicting priorities with other value-based programs that my organization is pursuing 10
- ☐ Uncertainty about return on investment or concerns about financial burden of implementing PCF 11
- ☐ Administrative burden of partnership in PCF 12

Other factors

- ☐ Uncertainty about the level of multi-payer collaboration in my region 13
- ☐ Uncertainty in the healthcare landscape (e.g., disruptions caused by the COVID-19 pandemic) 14
- ☐ Other (Please describe) 99

CAUTION: Your survey has not been submitted until you click "Next" below and receive a confirmation number. You will not be able to make any changes after you click "Next".

Before clicking submit, you have the option to view and print a copy of your completed survey. This printable version of the survey will open in a new tab. Please come back to this tab and click "Submit" below to submit your survey.

If there are any responses that you do not wish to share with CMS, please list the question(s) below.

Thank you for completing the payer survey!

Your confirmation number is: _____

If you have questions about this survey, please contact Brianna Sullivan at Mathematica (BSullivan@mathematica-mpr.com or 617-715-9953).

3.B. Practice Survey

This Appendix describes the CPC+ Practice Survey used to assess how practices that began participating in CPC+ in 2017 have changed the way they deliver care in response to CPC+, as well as their organizational characteristics and experiences with CPC+ (including with data feedback, learning supports, and CPC+ payments). It details survey fielding (Section 3.B.1), sampling and weighting methods (Section 3.B.2), survey content (Section 3.B.3), analytic methods (Section 3.B.4), and data tables (Section 3.B.5); and includes the Program Year (PY) 4 Practice Survey instrument (Section 3.B.6).

3.B.1. Survey fielding

A. Timing of survey administration

We administered four waves of the CPC+ Practice Survey to practices that began CPC+ in 2017, one survey in each program year. The first survey was administered to practices from March 30, 2017, through September 24, 2017, three to nine months after CPC+ began (Table 3.B.1). The second, third, and fourth waves were administered roughly 1.5, 2.5, and 3.5 years into CPC+.

Table 3.B.1. CPC+ Practice Survey administration dates

PY	Wave	Fielding dates	Months after CPC+ began (program year)
1	Wave 1	March 30, 2017–September 25, 2017	3–9 months[a]
2	Wave 2	June 6, 2018–September 25, 2018	18–21 months
3	Wave 3	July 16, 2019–November 18, 2019	31–35 months
4	Wave 4	September 15, 2020–December 14, 2020	45–48 months

[a] The PY 1 field period was longer than the periods for other waves because we fielded the survey to comparison practices two months after fielding it to CPC+ practices, due to the comparison practice selection timeline. We allowed CPC+ practices to respond up to the end of the fielding period for comparison practices, though 99 percent of CPC+ practices had responded by the end of July 2017.

PY = Program Year.

We also administered the PY 1 and PY 3 CPC+ Practice Surveys to comparison practices that were selected via propensity score matching to have similar characteristics to the CPC+ practices before CPC+ began. See Appendix 6.C of the CPC+ second annual report (Ghosh et al. 2020) for more information on comparison practice selection, and Appendix 3.B of the CPC+ third annual report (Orzol et al. 2021) for more information on the comparison Practice Survey.

B. Survey mode, fielding procedures, length, and incentive

Survey mode. Mathematica designed the CPC+ Practice Survey; it was fielded primarily over the web, though a small number of practices that were no longer participating in CPC+ completed a paper questionnaire.[8]

Fielding procedures. Depending on practice type and survey wave, Telligen, another CMS contractor, or Mathematica fielded the survey to practices (see Table 3.B.2). We obtained email and mailing addresses for CPC+ practices from Telligen, which asks practices to update their contact information regularly. The fielding periods for the PYs 1, 2, 3, and 4 surveys were 26, 16, 18, and 13 weeks, respectively. We used different fielding procedures for practices that were actively participating in CPC+ and those that had withdrawn or were terminated from CPC+. Practices that were actively participating in CPC+ were required to complete the questionnaire; they received reminders in CPC+-wide communications such as CPC+ newsletters, in addition to reminder emails sent by Telligen or Mathematica. Withdrawn or terminated CPC+ practices received more reminders, including some hard copy letter mailings, to maximize survey visibility and response rates; practices for which we did not have a valid email address received only hard copy mailings and fewer reminders, due to cost. See Table 3.B.2 for an overview of fielding procedures by survey wave and sample group.

Table 3.B.2. Fielding procedures for CPC+ Practice Survey

	Participating CPC+ practices	Withdrawn/terminated CPC+ practices *with* email address available[a]	Withdrawn/terminated CPC+ practices *without* email address available[a]
All survey waves			
Survey invitation mode and content	Email with log-in and FAQs	Mailed letter with log-in, CPC+ fact sheet, and FAQs Email with log-in and FAQs	Mailed letter with log-in, CPC+ fact sheet, and FAQs
Approximate reminder frequency	Weekly to biweekly	Weekly to biweekly	Biweekly
PY 1 follow-up to non-responding practice managers			
Who fielded survey	Telligen	Mathematica	Mathematica
Number of reminders	Six reminder emails between weeks 2 and 10 of fielding	Eight reminder emails, one mailed reminder postcard, and three mailed reminder letters between weeks 2 and 16 of fielding	Four mailed reminder postcards and six mailed reminder letters between weeks 2 and 16 of fielding
Telephone outreach	Started 11 weeks into fielding	Started 9 weeks into fielding	Started 9 weeks into fielding
Other reminders or outreach	Survey announced in weekly CPC+ newsletter (“CPC+ roundup”) twice before fielding and nine times throughout fielding	Survey endorsement letters[b] were linked in reminder emails in weeks 2 and 3, and mailed with the reminder letter in week 4	Survey endorsement letters[b] were mailed with the reminder letter in week 4

[8] Practices no longer participating in CPC+ include those that were once in CPC+ but withdrew or were terminated before the survey was administered.

Table 3.B.2. ***(continued)***

	Participating CPC+ practices	Withdrawn/terminated CPC+ practices *with* email address available[a]	Withdrawn/terminated CPC+ practices *without* email address available[a]
Paper questionnaire (included in reminder contact)	Not offered or sent	Offered 8 weeks into fielding by request and mailed to all non-responders in week 15	Offered 8 weeks into fielding by request and mailed to all non-responders in week 15
PY 2 follow-up to non-responding practice managers			
Who fielded survey	Telligen	Mathematica	Mathematica
Number of reminders	Same as PY 1	Nine reminder emails and one mailed reminder letter between weeks 2 and 16 of fielding	One mailed reminder postcard and four mailed reminder letters between weeks 2 and 16 of fielding[c]
Telephone outreach	Same as PY 1	None	None
Other reminders or outreach	Survey announced in weekly CPC+ newsletter (renamed "On the Plus Side"), posted on the CPC+ calendar, and CPC+ All Connect chatter post once before fielding and nine times throughout fielding	None	None
Paper questionnaire (included in reminder contact)	Not offered or sent	Not offered or sent	Not offered or sent
PY 3 follow-up to non-responding practice managers			
Who fielded survey	Telligen	Mathematica	Mathematica
Number of reminders	Same as PY 1	Seven reminder emails, and two mailed reminder letters between weeks 2 and 16 of fielding	Seven mailed reminder letters between weeks 2 and 15 of fielding
Telephone outreach	Started 7 weeks into fielding	Started 6 weeks into fielding	Started 6 weeks into fielding
Other reminders or outreach	Survey announced in weekly CPC+ newsletter (renamed "On the Plus Side"), posted on the CPC+ calendar, and CPC+ All Connect chatter post twice before fielding and eight times throughout fielding	Advance email sent three weeks prior to fielding to gauge quality of email addresses Survey endorsement letters[b] were linked in reminder emails in weeks 2 and 3, and mailed with the reminder letter in week 4	Survey endorsement letters[b] were mailed with the reminder letter in week 4
Paper questionnaire (included in reminder contact)	Not offered or sent	Sent in week 11 of fielding	Sent in week 11 of fielding
PY 4 follow-up to non-responding practice managers			
Who fielded survey	Mathematica	Mathematica	Mathematica
Number of reminders	Seven reminder emails between weeks 2 and 11 of fielding	Five reminder emails, and two mailed reminder letters between weeks 2 and 12 of fielding	Five mailed reminder letters between weeks 2 and 11 of fielding
Telephone outreach	Started 8 weeks into fielding (conducted by Telligen)	None	None

Table 3.B.2. ***(continued)***

	Participating CPC+ practices	Withdrawn/terminated CPC+ practices *with* email address available[a]	Withdrawn/terminated CPC+ practices *without* email address available[a]
Other reminders or outreach	Survey announced in weekly CPC+ newsletter (renamed "On the Plus Side"), posted on the CPC+ calendar, and CPC+ All Connect chatter post twice before fielding and nine times throughout fielding	None	None
Paper questionnaire (included in reminder contact)	Not offered or sent	Not offered or sent	Not offered or sent

[a] All withdrawn or terminated CPC+ practices had valid email addresses at the start of the PY 1 and 2 surveys, but by the PY 3 survey, 11 percent did not have a valid email address; we obtained email addresses for all practices by the PY 4 survey.

[b] We sent a letter from the American College of Physicians and one from the American Academy of Family Physicians endorsing the survey to practice managers to encourage survey completion.

[c] Because all cases had a valid email address at the beginning of fielding the PY 2 survey, we sent these mailed reminders only if messages to email addresses bounced back or practice managers changed.

FAQs = Frequently Asked Questions; PY = Program Year.

Length. The questionnaire was designed to be completed in 30 to 60 minutes, depending on the respondent and the survey wave. In general, the questionnaire administered to practices that participated in CPC+ in the past year (those that were still participating or recently withdrew or were terminated from CPC+) took longer to complete than the one administered to those that withdrew or were terminated earlier. The completion time differed because we asked the currently participating or recently withdrawn or terminated practices about their experiences with CPC+ (see Section 3.B.3 for information on survey content).

Respondent. The questionnaire was sent to the practice manager. The instructions encouraged the practice manager to discuss the survey with the practice's practitioners and staff to deliver responses that reflected a consensus view.

Incentive. CPC+ practices were required to respond to the survey as a condition of participation, so we did not compensate them for doing so. Practices that had withdrawn from CPC+ prior to survey fielding were offered $100 to complete the PY 1 survey and $200 to complete the PY 2, PY 3, and PY 4 surveys.[9]

Confidentiality. Practices were told that responses would not be shared with CMS or other payers; their responses would not have any consequences for payment or affect practices' participation in CPC+, but would be shared with the CPC+ learning team so it could provide learning support. Mathematica only provided responses about learning supports to the learning team in aggregate to encourage candid responses.

[9] We increased the incentive payment for the PY 2 through PY 4 surveys because we increased the length of the survey to include new questions on the primary care functions and new sections on data feedback and participation in CPC+.

3.B.2. Sampling and weighting methods

A. Sampling, sample sizes, and response rates

We surveyed practices that began participating in CPC+ in 2017 and did not withdraw in the first quarter of CPC+, regardless of whether they were still participating in CPC+ at the time of the survey. Each year, we also added to the survey any new practices that split off from these "2017 Starters" to operate as their own CPC+ practice. We did not send questionnaires to CPC+ practices that closed or were no longer providing primary care at the start of survey fielding. See Table 3.B.3 for sample sizes and response rates per survey wave.

Below, we describe our process for sampling practices for the CPC+ Practice Survey by wave; in Section B, we describe how we further refined the sample for the analysis.

PY 1 survey. Telligen and Mathematica[10] fielded the PY 1 survey to the 2,888 CPC+ practices that began CPC+ in January 2017 and did not withdraw from CPC+ by the end of the first quarter: 1,373 in Track 1 and 1,515 in Track 2. Of those practices, 19 did not respond to the survey or answer enough questions to consider their response complete, for a response rate of 99.3 percent (see Section B for our definition of a complete survey).

PY 2 survey. In PY 2, Telligen and Mathematica fielded the survey to the 2,833 practices that were still participating in CPC+ or had withdrawn or been terminated from CPC+ in the past year and were offering primary care at the start of fielding: 1,349 in Track 1 and 1,484 in Track 2. Of those practices, 62 did not respond to the survey or answer enough questions for the survey team to consider their response complete, for a response rate of 97.8 percent.

PY 3 survey. In PY 3, Telligen and Mathematica fielded the survey to 2,776 CPC+ practices: 1,312 in Track 1 and 1,464 in Track 2. This included all CPC+ practices that were open at the start of fielding. Of those 2,776 practices, 114 did not respond to the survey or answer enough questions for the survey team to consider their response complete, for a response rate of 95.9 percent.

PY 4 survey. In PY 4, Mathematica fielded the survey to 2,576 CPC+ practices: 1,185 in Track 1 and 1,391 in Track 2. This included all practices actively participating in CPC+ and those that had withdrawn or been terminated from CPC+ in the past year and were still open at the start of fielding. Of those 2,576 practices, 56 did not respond to the survey or answer enough questions for the survey team to consider their response complete, for a response rate of 97.8 percent.

[10] In PY 1 through PY 3, Telligen fielded the survey to CPC+ practices that were actively participating in CPC+ and Mathematica fielded it to those that had withdrawn or were terminated from CPC+. If a practice withdrew or was terminated during the survey fielding period, Mathematica took over fielding after receiving approval from CMS that the practice could be contacted. In PY 4, Mathematica fielded the survey to all surveyed practices.

Table 3.B.3. CPC+ Practice Survey sample sizes and response rates

	Track 1	Track 2	Total
PY 1			
In sample frame	1,373	1,515	2,888
Sent surveys	1,373	1,515	2,888
Returned surveys	1,367	1,508	2,875
Returned eligible and complete surveys	1,364	1,505	2,869
In analytic sample[a]	1,129	1,342	2,471
Response rate (percentage, unweighted)	99.3	99.3	99.3
Percentage of eligible practices included in analysis	82.2	88.6	85.6
PY 2			
In sample frame	1,349	1,484	2,833
Sent surveys	1,349	1,484	2,833
Returned surveys	1,311	1,463	2,774
Returned eligible and complete surveys	1,308	1,463	2,771
In analytic sample[a]	1,129	1,342	2,471
Response rate (percentage, unweighted)	97.0	98.6	97.8
Percentage of eligible practices included in analysis	83.7	90.4	87.2
PY 3			
In sample frame	1,312	1,464	2,776
Sent surveys[b]	1,312	1,464	2,776
Returned surveys	1,239	1,427	2,666
Returned eligible and complete surveys	1,237	1,425	2,662
In analytic sample[a]	1,129	1,342	2,471
Response rate (percentage, unweighted)	94.3	97.3	95.9
Percentage of eligible practices included in analysis	86.1	91.7	89.0
PY 4			
In sample frame	1,185	1,391	2,576
Sent surveys[b]	1,185	1,391	2,576
Returned surveys	1,163	1,357	2,520
Returned eligible and complete surveys	1,163	1,357	2,520
In analytic sample[a]	1,129	1,342	2,471
Response rate (percentage, unweighted)	98.1	97.6	97.8
Percentage of eligible practices included in analysis	95.3	96.5	95.9

[a] The analytic sample is smaller than the number of completed surveys because it excludes practices that did not respond in all survey waves and those that withdrew from CPC+ more than a year before any survey wave was fielded.

[b] Additional practices that split off from existing CPC+ practices were sent questionnaires in PY 3 and PY 4. This amounted to an additional 72 CPC+ practices (39 in Track 1 and 33 in Track 2) in PY 3 and 83 (38 in Track 1 and 45 in Track 2) in PY 4. These practices are not included in the counts, as they were sent questionnaires solely to provide feedback to the CPC+ learning network and were not included in practice survey analyses.

B. Eligibility and weighting

Eligibility. For each survey wave, all CPC+ practices were eligible to participate in the survey if they provided primary care and were open at the time of fielding. In PY 4, however, we did not send questionnaires to practices that had stopped participating in CPC+ more than one year before fielding, even though they were eligible to participate in the survey. We did not survey these practices because the PY 4 survey questions focused on practices' experience with CPC+ and they had not participated in CPC+ since the last time they were asked to complete the survey.

Completed questionnaires. For the PY 1 through PY 3 surveys, we considered a questionnaire complete if the practice responded to 29 of the 38 questions (more than 75 percent of the questions) included in the original (PY 1) modified Patient-Centered Medical Home Assessment (M2-PCMH-A) composite measure (for more information on the M2-PCMH-A, see Appendix 3.B of the third annual CPC+ report [Orzol et al. 2021]). Because the questions changed with each wave of the survey, if an item was not asked in a given wave, we counted it as answered for the purposes of determining whether a questionnaire was complete. This practice helped ensure the statistical reliability of the M2-PCMH-A summary score for the care delivery approaches. For the PY 4 survey, which did not include the M2-PCMH-A to reduce the burden on respondents, we considered a questionnaire complete if the practice responded to any of the items.

Analytic sample. To be included in this analysis, CPC+ practices had to submit a completed questionnaire for all four survey waves.[11] In our analysis, we included survey responses from 2,471 CPC+ practices: 1,129 practices in Track 1 and 1,342 in Track 2. Among the 2,471 practices, we included responses from 17 practices that withdrew or were terminated from CPC+ within the year before fielding. (Practices that stopped participating in CPC+ earlier were not eligible to receive the PY 4 questionnaire.) Table 3.B.3 reports counts of practices in the analytic sample.

The practices included in the analysis represent 82 to 95 percent of eligible Track 1 CPC+ practices and 89 to 97 percent of eligible Track 2 CPC+ practices, depending on the survey wave.

Calculating weights. We did not apply weights to the CPC+ practices' responses due to the high survey response rate.

3.B.3. Survey content

The survey collects general information about practices' characteristics, care delivery approaches, and experience with CPC+. The PY 4 survey questionnaire was divided into six sections. The first section asked about practice characteristics. The second section asked about

[11] The analytic sample does not include CPC+ practices that merged with another CPC+ practice after completing one survey wave and did not respond to all subsequent surveys. It also excludes "new" CPC+ practices that resulted from splitting from another CPC+ practice.

care management. The third section asked about sources of practice revenue. The fourth through sixth sections asked about practices' experience with CPC+ payments, learning activities and assistance, practice staff involvement in implementing CPC+, and perceptions of CPC+.

The PY 4 survey included the following changes from the PY 3 survey: (1) we dropped 81 survey items; (2) we edited question text or response options to 7 items; and (3) we added 43 new items, largely covering care management, payments from CPC+ payer partners, experiences with COVID-19, and plans for sustaining care delivery procedures. We shortened the survey in PY 4 to reduce practice burden in light of the coronavirus disease 2019 (COVID-19) pandemic by cutting the M2-PCMH-A, which asks about specific care delivery approaches, and reducing the number of items on practice site characteristics, data feedback, health information technology, practice revenue, and practice facilitator activities. See Table 3.B.10 for details on the 7 survey items that were altered and Section 3.B.6 for the full PY 4 Practice Survey instrument.

3.B.4. Analytic methods

Statistical estimation. To reduce the risk of false positives from multiple comparisons, we did not statistically test differences over time or between groups. Instead, we drew inferences based on findings across related questions and in the presence of substantial difference (which we determined to be 10 percentage points or more).

Subgroups: For selected questions where subgroup analysis could be important from a clinical, implementation, or policy perspective, we also estimated the effects of CPC+ on key subgroups of practices based on their characteristics. We did not perform subgroup analysis for all questions, nor did we perform the same subgroup analyses across each question. We considered the following practice characteristics for subgroup analysis:

- Practice ownership by a hospital or a health system, or independently owned[12]
- Practice size (measured by number of primary care practitioners at practice site): large (six or more practitioners), medium (three to five practitioners), or small (one or two practitioners)[13]

[12] Practice ownership comes from the SK&A and OneKey databases, both managed by IQVIA, a marketing organization that collects information directly from all health care practices in the United States. IQVIA updates this information on an ongoing basis; we pulled practice ownership information in October 2019 from OneKey. If the database did not report practice ownership as of October 2019, we used the most recent data available in the SK&A database, from October 2018, November 2017, or November 2016.

[13] Practice size is determined from the number of primary care practitioners (PCPs) as of December 2019. Practices self-reported this information to CMS in roster files. If practice size was missing, we used the number of PCPs reported on the December 2018, December 2017, or January 2017 roster files, taking the most recently available.

- Whether the practice site is in a rural, suburban, or urban area[14]
- Whether the practice site participated in CPC Classic[15]
- Whether the practice site participated in prior practice transformation activities (was recognized as a medical home or participated in the Multi-Payer Advanced Primary Care Practice [MAPCP] or CPC Classic initiatives)[16]

Counts of practitioners and staff. The survey asked practices to provide counts of full- and part-time practitioners regardless of specialty (Question A1), primary care practitioners (Question A2), nurses and medical assistants (Question C8), and care managers or care coordinators (Question C10). To estimate the full-time equivalent (FTE) number of employees, we counted part-time practitioners and staff as 0.5 FTE.

Software. We used SAS version 9.4 to clean and prepare the data for analysis and to construct the data tables.

3.B.5. Data tables

This section presents five sets of tables showing results from the PY 1, PY 2, PY 3, and PY 4 practice surveys:

- **Tables 3.B.4. Practice characteristics**
  - Table 3.B.4a. CPC+ practice characteristics, overall by track (2017 Starters)
  - Table 3.B.4b. CPC+ practice characteristics, overall by track and SSP status (2017 Starters)
- **Tables 3.B.5. Payments**
  - Table 3.B.5a. Practice payments, overall by track (2017 Starters)

[14] Geographic location is derived from the 2015–2016 Department of Health and Human Services' Area Health Resource File (AHRF). The variable used reflects 2013 data. The AHRF provides a 9-point rural-urban continuum code (RUCC) from the USDA Economic Research Service. From these codes, we defined urban as a county in a metro area of more than 250,000 people (RUCC=1 or 2), suburban as a county in a metro area that has less than 250,000 people or has an urban population of 20,000 or more and is adjacent to a metro area (RUCC=3 or 4), or rural if it does not meet the urban or suburban classifications (RUCC=5–9).

[15] We considered a practice to have participated in CPC Classic if it enrolled in CPC Classic and did not drop out within the first five months of the model.

[16] We determined a practice to have prior transformation experience if the practice participated in CPC Classic (as described in footnote 14) or CMS's Multi-payer Advanced Primary Care Practice (MAPCP) initiative, or has medical home recognition. We considered a practice to be a MAPCP participant if it participated in any year, 2011–2014 for 2017 Starters, as determined by a file from CMS. A practice was considered to have medical home recognition if at least one of its primary care providers was listed as having recognition at some point in 2014–2017 from the National Committee for Quality Assurance (NCQA), a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), or the Utilization Review Accreditation Commission (URAC), as determined by the June 2016 (for 2017 Starters) NCQA PCMH file and data extracted from the websites of TJC, AAAHC, URAC, and state-specific sources between October 2016 and February 2017.

  - Table 3.B.5b. Practice payments, overall by track and SSP status (2017 Starters)

- **Tables 3.B.6. CPC+ supports**
  - Table 3.B.6a. CPC+ practices' perceptions of CPC+ supports, overall by track (2017 Starters)
  - Table 3.B.6b. CPC+ practices' perceptions of CPC+ supports, overall by track and SSP status (2017 Starters)
- **Tables 3.B.7. CPC+ experience.** CPC+ practices' experience with CPC+, overall by track and SSP status (2017 Starters)
  - Table 3.B.7a. PC+ practices' experience with CPC+, overall by track (2017 Starters)
  - Table 3.B.7b. CPC+ practices' experience with CPC+, overall by track and SSP status (2017 Starters)
- **Table 3.B.8. Changes in item and response category wording over time.** Describes differences in item wording and response categories in questions that were asked in multiple survey waves but experienced wording changes.

Table 3.B.4a. CPC+ practice characteristics, overall by track (2017 Starters)

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Practice size and staffing													
A1	Number of full-time equivalent[b] practitioners[c] (primary care and specialty) at the practice site												
	0-1.5	16%	14%	14%	14%	21%	19%	18%	19%	13%	11%	10%	10%
	2-2.5	18%	18%	18%	16%	18%	18%	19%	17%	18%	18%	17%	16%
	3-3.5	16%	16%	16%	14%	15%	16%	17%	15%	16%	16%	15%	13%
	4-6.5	29%	28%	30%	32%	26%	27%	27%	30%	31%	30%	32%	34%
	7+	21%	23%	23%	24%	19%	19%	20%	20%	23%	25%	27%	27%
	N	2,471	2,470	2,464	2,470	1,129	1,129	1,126	1,128	1,342	1,341	1,338	1,342
A1a	Number of full-time equivalent[b] physicians (primary care and specialty) at the practice site												
	0-1.5	29%	29%	29%	29%	34%	34%	34%	34%	25%	26%	25%	26%
	2-2.5	22%	22%	22%	20%	23%	23%	22%	22%	22%	21%	21%	19%
	3-3.5	16%	16%	16%	15%	15%	15%	15%	14%	18%	17%	16%	15%
	4-6.5	21%	21%	22%	23%	18%	19%	19%	19%	23%	23%	25%	26%
	7+	11%	12%	12%	13%	10%	10%	10%	11%	12%	13%	13%	14%
	N	2,471	2,470	2,464	2,470	1,129	1,129	1,126	1,128	1,342	1,341	1,338	1,342
A1b-e	Number of full-time equivalent[b] non-physician practitioners[c] (primary care and specialty) at the practice site	.	.	.	.	.	.	.	.	.	.	.	.
	0-1.5	70%	66%	63%	62%	72%	68%	67%	66%	68%	64%	60%	58%
	2-2.5	14%	15%	17%	17%	12%	15%	16%	16%	16%	16%	18%	18%
	3-3.5	6%	7%	8%	9%	6%	6%	7%	8%	5%	7%	9%	10%
	4-6.5	6%	6%	6%	6%	5%	6%	5%	5%	6%	6%	7%	6%
	7+	5%	6%	6%	6%	5%	6%	5%	6%	5%	7%	7%	7%
	N	2,471	2,470	2,464	2,470	1,129	1,129	1,126	1,128	1,342	1,341	1,338	1,342
A2	Number of full-time equivalent[b] primary care practitioners with own NPI at the practice site	.	.	.	.	.	.	.	.	.	.	.	.
	0-1.5	17%	15%	14%	15%	22%	20%	19%	20%	13%	12%	10%	10%
	2-2.5	19%	18%	18%	17%	19%	19%	19%	17%	19%	18%	17%	17%
	3-3.5	16%	17%	16%	15%	16%	17%	17%	16%	16%	17%	16%	14%
	4-6.5	30%	29%	31%	32%	27%	28%	29%	30%	31%	30%	32%	34%
	7+	18%	20%	21%	21%	16%	17%	17%	17%	20%	24%	25%	24%
	N	2,471	2,471	2,471	2,471	1,129	1,129	1,129	1,129	1,342	1,342	1,342	1,342

Table 3.B.4a *(continued)*

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
A2a	Number of full-time equivalent[b] primary care physicians with own NPI at the practice site	.	.	.	.	.	.	.	.	.	.	.	.
	0-1.5	30%	30%	30%	31%	35%	35%	35%	35%	26%	26%	25%	27%
	2-2.5	23%	22%	22%	21%	23%	23%	23%	22%	22%	21%	22%	20%
	3-3.5	16%	16%	16%	15%	15%	15%	15%	15%	18%	17%	16%	15%
	4-6.5	21%	22%	23%	23%	19%	18%	19%	19%	24%	25%	26%	25%
	7+	9%	10%	10%	11%	8%	9%	8%	9%	10%	11%	11%	12%
	N	2,471	2,471	2,471	2,471	1,129	1,129	1,129	1,129	1,342	1,342	1,342	1,342
A2b-e	Number of full-time equivalent[b] non-physician primary care practitioners[c] with own NPI at the practice site	.	.	.	.	.	.	.	.	.	.	.	.
	0-1.5	71%	68%	65%	63%	73%	70%	68%	67%	70%	66%	61%	60%
	2-2.5	14%	15%	17%	17%	12%	15%	17%	16%	16%	16%	18%	17%
	3-3.5	6%	6%	8%	9%	6%	6%	6%	7%	5%	7%	9%	10%
	4-6.5	5%	6%	5%	6%	4%	5%	5%	5%	5%	6%	6%	6%
	7+	4%	5%	5%	6%	4%	5%	4%	5%	4%	5%	6%	6%
	N	2,471	2,471	2,471	2,471	1,129	1,129	1,129	1,129	1,342	1,342	1,342	1,342
	Practice site has full- or part-time:	.	.	.	.	.	.	.	.	.	.	.	.
A3a	Clinical psychologist, psychiatrist, or clinical social worker (behavioral health specialists)	25%	42%	50%	57%	18%	26%	34%	45%	31%	55%	64%	68%
A3b	Quality improvement (QI) specialist	33%	42%	45%	48%	28%	42%	41%	45%	37%	42%	48%	51%
A3c	Health educator, dietitian, or nutritionist	27%	31%	34%	34%	20%	25%	28%	26%	34%	36%	39%	40%
A3d	Clinical pharmacist or doctor of pharmacy	18%	21%	32%	39%	14%	15%	20%	24%	21%	25%	42%	52%
	N	2,462	2,464	2,456	2,455	1,127	1,126	1,126	1,119	1,335	1,338	1,330	1,337
A4	Practice is part of a larger health care system that includes a hospital	.	.	.	.	.	.	.	.	.	.	.	.
	Yes	n.a.	n.a.	n.a.	63%	n.a.	n.a.	n.a.	63%	n.a.	n.a.	n.a.	63%
	No	n.a.	n.a.	n.a.	37%	n.a.	n.a.	n.a.	37%	n.a.	n.a.	n.a.	37%
	N	n.a.	n.a.	n.a.	2,465	n.a.	n.a.	n.a.	1,128	n.a.	n.a.	n.a.	1,337
Care management													
B1a-b	Number of full-time equivalent[b] care managers/care coordinators[d]	.	.	.	.	.	.	.	.	.	.	.	.
	0	20%	5%	4%	3%	28%	7%	6%	4%	12%	3%	2%	2%
	0.5	23%	23%	21%	18%	22%	27%	22%	20%	24%	20%	20%	16%
	1-1.5	38%	40%	45%	45%	35%	39%	46%	47%	40%	41%	45%	44%
	2-2.5	11%	19%	16%	17%	8%	15%	15%	14%	15%	22%	17%	19%
	3+	8%	13%	14%	17%	6%	12%	11%	14%	10%	15%	16%	20%
	N	2,455	2,455	2,461	2,468	1,119	1,123	1,127	1,126	1,336	1,332	1,334	1,342

Table 3.B.4a *(continued)*

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
B1a-b	Presence of care managers/care coordinators[d]	.	.	.	.	.	.	.	.	.	.	.	.
	Has at least one full-time care manager/care coordinator	47%	64%	64%	66%	40%	61%	60%	59%	53%	67%	67%	72%
	Has at least one part-time (but no full-time) care manager/care coordinator	33%	31%	32%	31%	31%	32%	34%	36%	34%	30%	31%	26%
	Has no care manager/care coordinator	19%	5%	4%	3%	28%	7%	6%	4%	12%	3%	2%	2%
	N	2,455	2,455	2,461	2,468	1,119	1,123	1,127	1,126	1,336	1,332	1,334	1,342
B2	Among practices with a care manager/coordinator, clinical background of care managers/care coordinators (multiple responses possible)	.	.	.	.	.	.	.	.	.	.	.	.
	Registered nurse (RN)	75%	77%	77%	79%	71%	73%	74%	76%	78%	79%	80%	82%
	Licensed practical nurse (LPN) or licensed vocational nurse (LVN)	20%	21%	23%	23%	17%	18%	22%	22%	22%	23%	24%	24%
	Medical assistant (MA)	22%	23%	26%	24%	26%	27%	32%	30%	19%	20%	21%	20%
	Social worker	12%	19%	21%	25%	10%	14%	19%	22%	14%	23%	22%	28%
	Other clinical background	9%	12%	12%	15%	9%	10%	10%	12%	10%	13%	13%	17%
	No clinical background	5%	4%	5%	5%	5%	4%	4%	3%	4%	4%	5%	6%
	N	1,971	2,340	2,371	2,391	800	1,046	1,062	1,074	1,171	1,294	1,309	1,317
B2a	Among practices with a care manager/coordinator, care managers and/or care coordinators have behavioral health training	.	.	.	.	.	.	.	.	.	.	.	.
	Yes	n.a.	44%	54%	59%	n.a.	37%	50%	55%	n.a.	50%	57%	62%
	No	n.a.	56%	46%	41%	n.a.	63%	50%	45%	n.a.	50%	43%	38%
	N	n.a.	2,329	2,356	2,388	n.a.	1,042	1,055	1,074	n.a.	1,287	1,301	1,314
B3	Among practices with a full-time care manager/coordinator, number of patients currently under longitudinal care management per full-time care manager[e]	.	.	.	.	.	.	.	.	.	.	.	.
	Mean	n.a.	n.a.	n.a.	138.30	n.a.	n.a.	n.a.	126.10	n.a.	n.a.	n.a.	146.70
	Median	n.a.	n.a.	n.a.	96	n.a.	n.a.	n.a.	88	n.a.	n.a.	n.a.	100
	N	n.a.	n.a.	n.a.	1,599	n.a.	n.a.	n.a.	651	n.a.	n.a.	n.a.	948
B4	Among practices with only a part-time care manager/coordinator, number of patients currently under longitudinal care management per part-time care manager[e]	.	.	.	.	.	.	.	.	.	.	.	.
	Mean	n.a.	n.a.	n.a.	94.00	n.a.	n.a.	n.a.	84.36	n.a.	n.a.	n.a.	104.90
	Median	n.a.	n.a.	n.a.	58	n.a.	n.a.	n.a.	54	n.a.	n.a.	n.a.	60
	N	n.a.	n.a.	n.a.	746	n.a.	n.a.	n.a.	396	n.a.	n.a.	n.a.	350

Table 3.B.4a *(continued)*

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
B5	Among practices with only a part-time care manager/coordinator, number of hours worked per week on longitudinal care management per part-time care manager[e]	.	.	.	.	.	.	.	.	.	.	.	.
	Mean	n.a.	n.a.	n.a.	14.69	n.a.	n.a.	n.a.	13.65	n.a.	n.a.	n.a.	15.88
	Median	n.a.	n.a.	n.a.	15	n.a.	n.a.	n.a.	12	n.a.	n.a.	n.a.	15
	N	n.a.	n.a.	n.a.	753	n.a.	n.a.	n.a.	400	n.a.	n.a.	n.a.	353
B6	Among practices with a care manager/coordinator, major challenges practice faces in providing longitudinal care management for chronic conditions (multiple responses possible)	.	.	.	.	.	.	.	.	.	.	.	.
	Risk stratification methods used to identify patients for longitudinal care management are sometimes inaccurate or do not allow adjustment based on clinical judgment	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	5%	n.a.	n.a.	n.a.	7%
	Processes used to assign patients to a care manager are inadequate	n.a.	n.a.	n.a.	2%	n.a.	n.a.	n.a.	2%	n.a.	n.a.	n.a.	1%
	Insufficient care manager staff time to provide longitudinal care management for chronic conditions	n.a.	n.a.	n.a.	15%	n.a.	n.a.	n.a.	15%	n.a.	n.a.	n.a.	15%
	Insufficient community-based resources to meet patient needs	n.a.	n.a.	n.a.	18%	n.a.	n.a.	n.a.	17%	n.a.	n.a.	n.a.	19%
	Care management staff lack sufficient skills	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	1%
	Logistical obstacles to reaching patients (such as incorrect patient contact information, hard to reach)	n.a.	n.a.	n.a.	8%	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	10%
	Lack of patient interest in interacting with a care manager	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	8%
	Insufficient patient adherence to care manager's recommendations	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	10%	n.a.	n.a.	n.a.	9%
	Insufficient practitioner buy-in of benefit of longitudinal care management services to patients	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	2%
	Insufficient organizational buy-in of benefit of longitudinal care management services to patients	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	5%	n.a.	n.a.	n.a.	3%
	Lack of or ineffective health IT functionality (HIT) to support longitudinal care management	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	8%	n.a.	n.a.	n.a.	9%
	Other challenge	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	9%

Table 3.B.4a *(continued)*

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	N	n.a.	n.a.	n.a.	2,444	n.a.	n.a.	n.a.	1,115	n.a.	n.a.	n.a.	1,329
B7	Among practices that reported insufficient care manager staff time as a major or minor challenge, the main reason the practice does not have sufficient care manager staff time for longitudinal care management	.	.	.	.	.	.	.	.	.	.	.	.
	Amount of CPC+ care management fees is not enough to support hiring more care managers	n.a.	n.a.	n.a.	25%	n.a.	n.a.	n.a.	23%	n.a.	n.a.	n.a.	27%
	Health care system does not provide practice with as much care manager time as their patient population needs	n.a.	n.a.	n.a.	10%	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	9%
	Care manager staff time is focused on episodic care management	n.a.	n.a.	n.a.	36%	n.a.	n.a.	n.a.	34%	n.a.	n.a.	n.a.	37%
	Inadequate supply of qualified care managers available to hire	n.a.	n.a.	n.a.	12%	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	14%
	Other	n.a.	n.a.	n.a.	18%	n.a.	n.a.	n.a.	23%	n.a.	n.a.	n.a.	13%
	N	n.a.	n.a.	n.a.	1,238	n.a.	n.a.	n.a.	578	n.a.	n.a.	n.a.	660
B1c	Among practices without a care manager/coordinator, the main reason the practice does not have a care manager/coordinator working as part of the care team	.	.	.	.	.	.	.	.	.	.	.	.
	Amount of CPC+ care management fees is not enough to support hiring care managers	n.a.	n.a.	n.a.	15%	n.a.	n.a.	n.a.	14%	n.a.	n.a.	n.a.	17%
	Health care system does not provide practice with care manager time	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	2%	n.a.	n.a.	n.a.	4%
	Practice or health care system does not think practice needs a care manager	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	12%	n.a.	n.a.	n.a.	8%
	Inadequate supply of qualified care managers available to hire	n.a.	n.a.	n.a.	17%	n.a.	n.a.	n.a.	16%	n.a.	n.a.	n.a.	21%
	Insufficient space at practice to accommodate a care manager	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	4%
	Other	n.a.	n.a.	n.a.	51%	n.a.	n.a.	n.a.	53%	n.a.	n.a.	n.a.	46%
	N	n.a.	n.a.	n.a.	75	n.a.	n.a.	n.a.	51	n.a.	n.a.	n.a.	24

Table 3.B.4a *(continued)*

Question[a]		Combined tracks				Track 1 overall				Track 2 overall			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Completion of the survey													
G1	Who provided input in completing the survey (multiple responses possible)	.	.	.	.	.	.	.	.	.	.	.	.
	Practice or office manager	82%	75%	74%	74%	81%	72%	72%	74%	82%	77%	76%	73%
	Lead physician	33%	21%	17%	18%	31%	20%	17%	16%	35%	23%	17%	19%
	Other physicians	7%	4%	3%	4%	6%	3%	3%	1%	7%	5%	3%	7%
	Nurse practitioner (NP), clinical nurse specialist (CNS), or physician assistant (PA)	6%	3%	4%	3%	6%	3%	3%	2%	6%	3%	4%	4%
	Care manager/coordinator	35%	31%	26%	37%	31%	32%	27%	34%	40%	30%	25%	39%
	Nursing staff, including nurse manager or supervisor	12%	6%	5%	5%	13%	8%	5%	5%	11%	5%	4%	4%
	Medical assistant staff	14%	7%	4%	4%	15%	10%	5%	4%	12%	5%	3%	3%
	Quality improvement staff	30%	31%	31%	36%	33%	34%	30%	33%	27%	29%	32%	38%
	Administrative support staff (e.g., billing or finance staff, front desk staff)	24%	20%	16%	17%	27%	18%	14%	16%	22%	21%	17%	18%
	Non-physician owner of practice	n.a.	1%	<1%	<1%	n.a.	1%	<1%	<1%	n.a.	1%	<1%	<1%
	Leadership or staff from larger health care system or medical group	24%	19%	20%	18%	22%	16%	14%	19%	25%	22%	25%	17%
	Data analytics staff	n.a.	20%	17%	16%	n.a.	20%	16%	15%	n.a.	19%	17%	18%
	CPC+ lead	n.a.	35%	38%	36%	n.a.	36%	35%	33%	n.a.	33%	40%	39%
	Patients	<1%	<1%	<1%	<1%	<1%	<1%	<1%	0%	0%	<1%	1%	<1%
	Other	12%	3%	3%	2%	13%	3%	3%	3%	11%	4%	3%	1%
	N	2,469	2,468	2,463	2,462	1,128	1,128	1,123	1,125	1,341	1,340	1,340	1,337

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices March through September 2017 (PY 1), June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] The question numbering is based on the PY 4 survey.

[b] Practices entered number of full-time and part-time staff separately. Full-time equivalent counts were estimated by counting all full-time staff as 1 FTE and all part-time staff as 0.5 FTE.

[c] Practitioners include physicians (MD or DO, not including psychiatrists), physician residents or fellows (trainees), nurse practitioners, physician assistants, and clinical nurse specialists. Non-physician practitioners include all types of practitioners listed but physicians.

[d] Item wording changed mid-field during the PY 1 survey to clarify that it was asking about care managers/coordinators who work as part of the practice's care team, regardless of where they physically work. Among 2017 Starter practices, 799 out of 2,833 practices responded to this question before the wording change.

[e] These questions only asked about the patient count for one care manager. If the practice had any full-time care managers, the patient count is for a full-time care manager (reported in B3). If the practice only had part-time care managers, the patient count is for a part-time care manager (reported in B4). If practices had more than one care manager who fit either of these descriptions, they were asked to report patient counts and hours worked for the care manager whose first name came first alphabetically. Thirty-one practices answered at the top of the survey-allowed range, which may not accurately reflect their actual patient count: 10 responded that the patient count for their full-time care manager was 999 (reported in

Table 3.B.4a *(continued)*

B3) and 21 responded that the patient count for their part-time care manager was 500 (reported in B4); these are included in the mean and median calculations. The hours worked per week on longitudinal care management (reported in B5) is for the care manager with the patient count reported in B4.

FTE = full-time equivalent; n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; NPI = National Provider Identifier; PY = Program Year.

Table 3.B.4b. CPC+ practice characteristics, overall by track and SSP status (2017 Starters)

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Practice size and staffing																	
A1	Number of full-time equivalent[b] practitioners[c] (primary care and specialty) at the practice site																
	0-1.5	22%	21%	20%	20%	20%	17%	15%	17%	15%	13%	11%	11%	10%	9%	9%	9%
	2-2.5	22%	20%	20%	19%	15%	17%	18%	15%	19%	18%	16%	16%	18%	18%	18%	16%
	3-3.5	15%	20%	18%	17%	15%	13%	15%	13%	14%	16%	15%	12%	18%	17%	15%	14%
	4-6.5	25%	24%	26%	28%	28%	30%	28%	32%	29%	26%	29%	31%	32%	32%	34%	36%
	7+	15%	15%	16%	17%	22%	23%	23%	23%	23%	28%	29%	29%	22%	24%	25%	25%
	N	594	594	592	594	535	535	534	534	617	616	615	617	725	725	723	725
A1a	Number of full-time equivalent[b] physicians (primary care and specialty) at the practice site																
	0-1.5	36%	37%	36%	36%	32%	30%	30%	31%	26%	25%	24%	24%	24%	26%	26%	28%
	2-2.5	25%	23%	23%	23%	21%	22%	22%	20%	21%	20%	20%	18%	22%	23%	21%	21%
	3-3.5	15%	16%	16%	15%	14%	14%	13%	14%	17%	16%	16%	15%	18%	18%	16%	16%
	4-6.5	16%	16%	16%	17%	21%	21%	22%	21%	23%	24%	23%	27%	24%	23%	26%	24%
	7+	9%	8%	8%	9%	12%	13%	12%	14%	14%	15%	17%	17%	11%	11%	11%	12%
	N	594	594	592	594	535	535	534	534	617	616	615	617	725	725	723	725
A1b-e	Number of full-time equivalent[b] non-physician practitioners[c] (primary care and specialty) at the practice site																
	0-1.5	75%	72%	71%	72%	69%	63%	63%	60%	71%	68%	62%	62%	66%	61%	57%	56%
	2-2.5	13%	14%	14%	13%	11%	16%	18%	18%	14%	13%	16%	15%	17%	18%	20%	19%
	3-3.5	5%	4%	6%	6%	8%	7%	8%	9%	4%	6%	8%	9%	6%	8%	9%	12%
	4-6.5	4%	4%	4%	4%	7%	7%	6%	7%	5%	6%	5%	5%	7%	7%	8%	7%
	7+	4%	5%	4%	5%	5%	6%	6%	7%	6%	8%	8%	9%	4%	6%	6%	6%
	N	594	594	592	594	535	535	534	534	617	616	615	617	725	725	723	725
A2	Number of full-time equivalent[b] primary care practitioners with own NPI at the practice site																
	0-1.5	23%	21%	21%	21%	21%	18%	17%	18%	15%	13%	11%	11%	11%	11%	10%	10%
	2-2.5	22%	21%	21%	20%	15%	16%	16%	15%	19%	18%	16%	17%	18%	18%	18%	17%
	3-3.5	16%	19%	18%	17%	16%	16%	16%	14%	15%	17%	16%	13%	18%	17%	16%	15%
	4-6.5	26%	25%	28%	28%	28%	30%	30%	32%	29%	28%	30%	33%	33%	32%	34%	36%
	7+	13%	14%	13%	15%	19%	20%	21%	21%	21%	25%	27%	26%	20%	22%	23%	23%
	N	594	594	594	594	535	535	535	535	617	617	617	617	725	725	725	725

Table 3.B.4b *(continued)*

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
A2a	Number of full-time equivalent[b] primary care physicians with own NPI at the practice site																
	0-1.5	37%	38%	37%	37%	33%	31%	33%	33%	27%	26%	24%	25%	25%	27%	27%	28%
	2-2.5	25%	24%	24%	24%	22%	23%	21%	20%	21%	20%	21%	19%	23%	23%	22%	21%
	3-3.5	15%	16%	17%	15%	14%	15%	14%	14%	17%	16%	16%	15%	18%	18%	16%	16%
	4-6.5	17%	16%	17%	17%	21%	20%	22%	21%	23%	25%	26%	27%	25%	24%	26%	24%
	7+	6%	7%	5%	7%	9%	10%	11%	11%	12%	13%	14%	14%	9%	9%	9%	10%
	N	594	594	594	594	535	535	535	535	617	617	617	617	725	725	725	725
A2b-e	Number of full-time equivalent[b] non-physician primary care practitioners[c] with own NPI at the practice site																
	0-1.5	76%	74%	72%	72%	70%	66%	64%	62%	73%	70%	64%	63%	67%	63%	59%	58%
	2-2.5	12%	14%	15%	14%	13%	15%	19%	19%	13%	13%	17%	16%	17%	18%	19%	19%
	3-3.5	5%	4%	5%	6%	7%	7%	7%	8%	5%	6%	8%	8%	6%	7%	9%	11%
	4-6.5	3%	3%	4%	4%	6%	6%	5%	6%	5%	5%	5%	5%	6%	7%	7%	7%
	7+	4%	5%	4%	4%	4%	5%	4%	5%	5%	6%	6%	8%	4%	5%	6%	5%
	N	594	594	594	594	535	535	535	535	617	617	617	617	725	725	725	725
	Practice site has full- or part-time:																
A3a	Clinical psychologist, psychiatrist, or clinical social worker (behavioral health specialists)	17%	26%	31%	44%	20%	27%	36%	47%	30%	57%	67%	75%	33%	54%	61%	61%
A3b	Quality improvement (QI) specialist	25%	42%	44%	42%	32%	42%	39%	48%	30%	43%	55%	56%	43%	42%	42%	48%
A3c	Health educator, dietitian, or nutritionist	20%	23%	27%	22%	20%	27%	29%	30%	31%	38%	41%	45%	36%	34%	38%	36%
A3d	Clinical pharmacist or doctor of pharmacy	13%	12%	17%	21%	15%	18%	23%	28%	20%	31%	45%	60%	22%	21%	40%	45%
	N	592	592	594	588	535	534	532	533	614	616	614	614	723	722	716	724
A4	Practice is part of a larger health care system that includes a hospital																
	Yes	n.a.	n.a.	n.a.	73%	n.a.	n.a.	n.a.	52%	n.a.	n.a.	n.a.	79%	n.a.	n.a.	n.a.	49%
	No	n.a.	n.a.	n.a.	27%	n.a.	n.a.	n.a.	48%	n.a.	n.a.	n.a.	21%	n.a.	n.a.	n.a.	51%
	N	n.a.	n.a.	n.a.	593	n.a.	n.a.	n.a.	535	n.a.	n.a.	n.a.	617	n.a.	n.a.	n.a.	720
Care management																	
B1a-b	Number of full-time equivalent[b] care managers/care coordinators[d]																
	0	25%	6%	7%	5%	32%	7%	4%	4%	11%	3%	2%	1%	14%	3%	2%	2%
	0.5	25%	33%	25%	23%	19%	20%	19%	17%	31%	27%	26%	18%	17%	13%	15%	13%
	1-1.5	41%	41%	46%	49%	29%	37%	45%	45%	36%	34%	42%	48%	44%	47%	48%	41%
	2-2.5	7%	12%	14%	12%	9%	20%	16%	17%	14%	23%	16%	18%	15%	21%	17%	20%
	3+	2%	8%	7%	11%	11%	16%	17%	17%	8%	13%	14%	14%	11%	16%	18%	24%
	N	588	588	594	594	531	535	533	532	616	613	612	617	720	719	722	725

Table 3.B.4b *(continued)*

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
B1a-b	Presence of care managers/care coordinators[d]																
	Has at least one full-time care manager/care coordinator	38%	55%	55%	58%	42%	67%	66%	60%	47%	58%	59%	66%	59%	74%	73%	76%
	Has at least one part-time (but no full-time) care manager/care coordinator	36%	38%	38%	37%	26%	26%	29%	35%	42%	38%	38%	32%	27%	22%	24%	22%
	Has no care manager/care coordinator	25%	6%	7%	5%	32%	7%	4%	4%	11%	3%	2%	1%	14%	3%	2%	2%
	N	588	588	594	594	531	535	533	532	616	613	612	617	720	719	722	725
B2	Among practices with a care manager/coordinator, clinical background of care managers/care coordinators (multiple responses possible)																
	Registered nurse (RN)	76%	75%	75%	78%	65%	71%	72%	73%	87%	88%	89%	89%	71%	72%	73%	76%
	Licensed practical nurse (LPN) or licensed vocational nurse (LVN)	19%	19%	26%	21%	15%	17%	19%	22%	18%	20%	18%	21%	25%	26%	29%	27%
	Medical assistant (MA)	22%	20%	29%	29%	30%	36%	35%	31%	16%	12%	13%	13%	22%	27%	28%	26%
	Social worker	5%	11%	14%	17%	16%	18%	23%	27%	9%	20%	19%	29%	18%	26%	25%	26%
	Other clinical background	5%	6%	7%	6%	15%	14%	14%	18%	8%	10%	10%	21%	11%	15%	15%	14%
	No clinical background	6%	3%	2%	3%	5%	5%	7%	4%	3%	3%	3%	6%	5%	5%	7%	5%
	N	441	551	551	565	359	495	511	509	550	595	602	608	621	699	707	709
B2a	Among practices with a care manager/coordinator, care managers and/or care coordinators have behavioral health training																
	Yes	n.a.	36%	47%	53%	n.a.	39%	53%	57%	n.a.	49%	60%	67%	n.a.	50%	54%	57%
	No	n.a.	64%	53%	47%	n.a.	61%	47%	43%	n.a.	51%	40%	33%	n.a.	50%	46%	43%
	N	n.a.	550	552	565	n.a.	492	503	509	n.a.	592	601	607	n.a.	695	700	707
B3	Among practices with a full-time care manager/coordinator, number of patients currently under longitudinal care management per full-time care manager[e]																
	Mean	n.a.	n.a.	n.a.	117.90	n.a.	n.a.	n.a.	134.80	n.a.	n.a.	n.a.	167.00	n.a.	n.a.	n.a.	131.60
	Median	n.a.	n.a.	n.a.	86	n.a.	n.a.	n.a.	92	n.a.	n.a.	n.a.	120	n.a.	n.a.	n.a.	93
	N	n.a.	n.a.	n.a.	337	n.a.	n.a.	n.a.	314	n.a.	n.a.	n.a.	404	n.a.	n.a.	n.a.	544

Table 3.B.4b *(continued)*

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
B4	Among practices with only a part-time care manager/coordinator, number of patients currently under longitudinal care management per part-time care manager[e]																
	Mean	n.a.	n.a.	n.a.	90.64	n.a.	n.a.	n.a.	77.04	n.a.	n.a.	n.a.	124.90	n.a.	n.a.	n.a.	78.52
	Median	n.a.	n.a.	n.a.	55	n.a.	n.a.	n.a.	50	n.a.	n.a.	n.a.	67	n.a.	n.a.	n.a.	50
	N	n.a.	n.a.	n.a.	213	n.a.	n.a.	n.a.	183	n.a.	n.a.	n.a.	199	n.a.	n.a.	n.a.	151
B5	Among practices with only a part-time care manager/coordinator, number of hours worked per week on longitudinal care management per part-time care manager[e]																
	Mean	n.a.	n.a.	n.a.	12.95	n.a.	n.a.	n.a.	14.45	n.a.	n.a.	n.a.	16.16	n.a.	n.a.	n.a.	15.53
	Median	n.a.	n.a.	n.a.	12	n.a.	n.a.	n.a.	16	n.a.	n.a.	n.a.	13	n.a.	n.a.	n.a.	15
	N	n.a.	n.a.	n.a.	215	n.a.	n.a.	n.a.	185	n.a.	n.a.	n.a.	199	n.a.	n.a.	n.a.	154
B6	Among practices with a care manager/coordinator, major challenges practice faces in providing longitudinal care management for chronic conditions (multiple responses possible)																
	Risk stratification methods used to identify patients for longitudinal care management are sometimes inaccurate or do not allow adjustment based on clinical judgment	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	3%
	Processes used to assign patients to a care manager are inadequate	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	2%
	Insufficient care manager staff time to provide longitudinal care management for chronic conditions	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	17%	n.a.	n.a.	n.a.	15%	n.a.	n.a.	n.a.	15%
	Insufficient community-based resources to meet patient needs	n.a.	n.a.	n.a.	16%	n.a.	n.a.	n.a.	18%	n.a.	n.a.	n.a.	19%	n.a.	n.a.	n.a.	19%
	Care management staff lack sufficient skills	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	1%	n.a.	n.a.	n.a.	<1%	n.a.	n.a.	n.a.	2%
	Logistical obstacles to reaching patients (such as incorrect patient contact information, hard to reach)	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	7%	n.a.	n.a.	n.a.	15%	n.a.	n.a.	n.a.	6%
	Lack of patient interest in interacting with a care manager	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	12%	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	9%
	Insufficient patient adherence to care manager's recommendations	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	10%	n.a.	n.a.	n.a.	5%	n.a.	n.a.	n.a.	12%

Table 3.B.4b *(continued)*

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	Insufficient practitioner buy-in of benefit of longitudinal care management services to patients	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	2%	n.a.	n.a.	n.a.	2%
	Insufficient organizational buy-in of benefit of longitudinal care management services to patients	n.a.	n.a.	n.a.	3%	n.a.	n.a.	n.a.	6%	n.a.	n.a.	n.a.	<1%	n.a.	n.a.	n.a.	5%
	Lack of or ineffective health IT functionality (HIT) to support longitudinal care management	n.a.	n.a.	n.a.	8%	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	7%
	Other challenge	n.a.	n.a.	n.a.	10%	n.a.	n.a.	n.a.	16%	n.a.	n.a.	n.a.	5%	n.a.	n.a.	n.a.	12%
	N	n.a.	n.a.	n.a.	589	n.a.	n.a.	n.a.	526	n.a.	n.a.	n.a.	612	n.a.	n.a.	n.a.	717
B7	Among practices that reported insufficient care manager staff time as a major or minor challenge, the main reason the practice does not have sufficient care manager staff time for longitudinal care management																
	Amount of CPC+ care management fees is not enough to support hiring more care managers	n.a.	n.a.	n.a.	19%	n.a.	n.a.	n.a.	26%	n.a.	n.a.	n.a.	24%	n.a.	n.a.	n.a.	29%
	Health care system does not provide practice with as much care manager time as their patient population needs	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	14%	n.a.	n.a.	n.a.	7%	n.a.	n.a.	n.a.	11%
	Care manager staff time is focused on episodic care management	n.a.	n.a.	n.a.	40%	n.a.	n.a.	n.a.	28%	n.a.	n.a.	n.a.	42%	n.a.	n.a.	n.a.	32%
	Inadequate supply of qualified care managers available to hire	n.a.	n.a.	n.a.	9%	n.a.	n.a.	n.a.	8%	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	15%
	Other	n.a.	n.a.	n.a.	23%	n.a.	n.a.	n.a.	24%	n.a.	n.a.	n.a.	14%	n.a.	n.a.	n.a.	12%
	N	n.a.	n.a.	n.a.	306	n.a.	n.a.	n.a.	272	n.a.	n.a.	n.a.	304	n.a.	n.a.	n.a.	356
B1c	Among practices without a care manager/coordinator, the main reason the practice does not have a care manager/coordinator working as part of the care team																
	Amount of CPC+ care management fees is not enough to support hiring care managers	n.a.	n.a.	n.a.	7%	n.a.	n.a.	n.a.	21%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	27%
	Health care system does not provide practice with care manager time	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	0%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	7%
	Practice or health care system does not think practice needs a care manager	n.a.	n.a.	n.a.	11%	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	13%
	Inadequate supply of qualified care managers available to hire	n.a.	n.a.	n.a.	19%	n.a.	n.a.	n.a.	13%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	13%

Table 3.B.4b *(continued)*

Question[a]		Track 1 – SSP				Track 1 – Not-SSP				Track 2 – SSP				Track 2 – Not-SSP			
		PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 1 (2017)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	Insufficient space at practice to accommodate a care manager	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	4%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	7%
	Other	n.a.	n.a.	n.a.	56%	n.a.	n.a.	n.a.	50%	n.a.	n.a.	n.a.	s.s.	n.a.	n.a.	n.a.	33%
	N	n.a.	n.a.	n.a.	27	n.a.	n.a.	n.a.	24	n.a.	n.a.	n.a.	9	n.a.	n.a.	n.a.	15
Completion of the survey																	
G1	Who provided input in completing the survey (multiple responses possible)																
	Practice or office manager	80%	69%	71%	73%	82%	76%	74%	75%	82%	76%	78%	73%	82%	78%	75%	73%
	Lead physician	25%	13%	12%	10%	36%	28%	23%	23%	28%	20%	10%	15%	41%	25%	22%	22%
	Other physicians	5%	2%	2%	1%	7%	4%	3%	1%	5%	4%	2%	10%	10%	5%	3%	4%
	Nurse practitioner (NP), clinical nurse specialist (CNS), or physician assistant (PA)	5%	2%	2%	1%	7%	4%	5%	2%	5%	3%	2%	5%	7%	4%	7%	3%
	Care manager/coordinator	33%	34%	26%	38%	28%	29%	28%	29%	41%	28%	25%	48%	38%	31%	25%	31%
	Nursing staff, including nurse manager or supervisor	11%	5%	3%	5%	14%	11%	8%	6%	9%	4%	3%	4%	14%	5%	5%	4%
	Medical assistant staff	13%	7%	3%	3%	17%	13%	7%	5%	10%	6%	2%	1%	14%	5%	4%	5%
	Quality improvement staff	34%	35%	33%	39%	32%	34%	26%	26%	24%	31%	40%	51%	29%	27%	26%	27%
	Administrative support staff (e.g., billing or finance staff, front desk staff)	30%	23%	14%	20%	23%	13%	14%	11%	19%	29%	24%	25%	24%	13%	12%	13%
	Non-physician owner of practice	n.a.	<1%	<1%	0%	n.a.	1%	<1%	1%	n.a.	1%	<1%	0%	n.a.	1%	1%	<1%
	Leadership or staff from larger health care system or medical group	28%	22%	17%	20%	16%	9%	12%	17%	30%	24%	39%	25%	21%	20%	12%	10%
	Data analytics staff	n.a.	25%	19%	17%	n.a.	14%	13%	12%	n.a.	25%	24%	26%	n.a.	15%	11%	11%
	CPC+ lead	n.a.	40%	39%	40%	n.a.	32%	31%	25%	n.a.	40%	52%	55%	n.a.	28%	29%	25%
	Patients	<1%	<1%	<1%	0%	1%	1%	<1%	0%	0%	<1%	<1%	<1%	0%	1%	1%	<1%
	Other	11%	3%	1%	2%	15%	4%	7%	5%	15%	5%	2%	2%	8%	3%	4%	1%
	N	593	594	590	591	535	534	533	534	617	616	617	615	724	724	723	722

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices March through September 2017 (PY 1), June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] The question numbering is based on the PY 4 survey.

[b] Practices entered number of full-time and part-time staff separately. Full-time equivalent counts were estimated by counting all full-time staff as 1 FTE and all part-time staff as 0.5 FTE.

[c] Practitioners include physicians (MD or DO, not including psychiatrists), physician residents or fellows (trainees), nurse practitioners, physician assistants, and clinical nurse specialists. Non-physician practitioners include all types of practitioners listed but physicians.

[d] Item wording changed mid-field during the PY 1 survey to clarify that it was asking about care managers/coordinators who work as part of the practice's care team, regardless of where they physically work. Among 2017 Starter practices, 799 out of 2,833 practices responded to this question before the wording change.

[e] These questions only asked about the patient count for one care manager. If the practice had any full-time care managers, the patient count is for a full-time care manager (reported in B3). If the practice only had part-time care managers, the patient count is for a part-time care manager (reported in B4). If practices had more than one care manager who fit either of these descriptions, they were asked to

Table 3.B.4b *(continued)*

report patient counts and hours worked for the care manager whose first name came first alphabetically. Thirty-one practices answered at the top of the survey-allowed range, which may not accurately reflect their actual patient count: 10 responded that the patient count for their full-time care manager was 999 (reported in B3) and 21 responded that the patient count for their part-time care manager was 500 (reported in B4); these are included in the mean and median calculations. The hours worked per week on longitudinal care management (reported in B5) is for the care manager with the patient count reported in B4.

FTE = full-time equivalent; n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; s.s. = small sample (cells with fewer than 11 responses have been suppressed); NPI = National Provider Identifier; PY = Program Year; SSP = Medicare Shared Savings Program (reflects 2020 [PY4] participation, or, for practices that withdrew from CPC+, their participation at the time of withdrawal).

Table 3.B.5a. Practice payments, overall by track (2017 Starters)

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Sources of practice revenue and physician compensation										
C1	Percentage of practice site's revenue that came from fee-for-service (FFS) payments in [the prior year]									
	Mean	76.71	77.06	75.72	77.73	78.46	79.95	75.83	75.90	72.20
	Median	85	85	85	90	89	88	81	80	80
	N	2,314	2,369	2,400	1,066	1,075	1,090	1,248	1,294	1,310
CPC+ payments from Medicare FFS										
D1	Considering the amount of work required by CPC+, the adequacy of the CPC+ payments from Medicare FFS									
	More than adequate	1%	1%	3%	1%	2%	2%	1%	1%	3%
	Adequate	46%	48%	53%	41%	41%	49%	51%	54%	57%
	Less than adequate	43%	43%	38%	47%	47%	42%	39%	39%	34%
	Don't know – not familiar with CPC+ payments from Medicare FFS or costs of doing CPC+ work	10%	8%	6%	11%	10%	7%	10%	6%	6%
	N	2,450	2,456	2,457	1,123	1,122	1,127	1,327	1,334	1,330
The Performance-Based Incentive Payment (PBIP) is paid prospectively by CMS at the beginning of each program year[b]…										
D2a	…Practice understands how Medicare FFS calculates the proportion of the PBIP the practice will retain and the proportion CMS recoups									
	Strongly agree	10%	16%	21%	10%	14%	23%	10%	18%	19%
	Agree	61%	64%	70%	58%	61%	67%	64%	66%	72%
	Disagree	23%	16%	8%	26%	20%	9%	21%	14%	8%
	Strongly disagree	5%	4%	1%	6%	6%	1%	5%	2%	1%
	N	1,270	1,473	1,416	510	559	572	760	914	844
D2b	…Practice feels that Medicare FFS's methodology is fair in how it determines the proportion of the PBIP the practice retains and the proportion CMS recoups									
	Strongly agree	3%	6%	5%	3%	7%	7%	3%	5%	4%
	Agree	43%	46%	56%	42%	45%	56%	43%	47%	56%
	Disagree	19%	26%	25%	17%	24%	23%	20%	27%	26%
	Strongly disagree	6%	6%	5%	7%	8%	5%	6%	5%	4%
	Don't know	29%	16%	10%	31%	16%	8%	28%	16%	11%
	N	1,291	1,500	1,426	521	565	575	770	935	851

Table 3.B.5a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
The Comprehensive Primary Care Payment (CPCP) is paid quarterly as a lump sum to Track 2 practices for evaluation and management services[c]…										
D3a	...Practice understands how Medicare FFS calculated its CPCPs									
	Strongly agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	12%	19%	16%
	Agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	64%	61%	68%
	Disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	21%	19%	15%
	Strongly disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3%	1%	1%
	N	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,272	1,295	1,295
D3b	...Practice feels that Medicare FFS's methodology is fair in how it calculates CPCPs									
	Strongly agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4%	6%	5%
	Agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	52%	54%	64%
	Disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	19%	22%	13%
	Strongly disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3%	5%	5%
	Don't know	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	22%	13%	13%
	N	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,328	1,330	1,336
CPC+ payments from CPC+ payer partners (not Medicare FFS)										
D4	Practice contracts with CPC+ payer partners (payers other than Medicare FFS) for CPC+[d]									
	Yes	79%	78%	88%	76%	72%	85%	82%	83%	90%
	No	21%	22%	12%	24%	28%	15%	18%	17%	10%
	N	2,426	2,450	2,465	1,102	1,120	1,127	1,324	1,330	1,338
D5	Among practices that contract with CPC+ payer partners for CPC+, considering the amount of work required by CPC+, the adequacy of the CPC+ payments from CPC+ payer partners[e]									
	More than adequate	<1%	2%	2%	1%	2%	1%	<1%	2%	3%
	Adequate	31%	38%	41%	29%	35%	40%	33%	41%	42%
	Less than adequate	56%	49%	42%	56%	48%	44%	57%	50%	41%
	Don't know – not familiar with CPC+ payments from CPC+ payer partners or costs of doing CPC+ work	12%	10%	15%	14%	15%	15%	11%	7%	15%
	N	1,937	1,915	2,156	842	805	957	1,095	1,110	1,199

Table 3.B.5a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
CPC+ capitated payments from CPC+ payer partners (not CMS/Medicare FFS)										
D6	Among practices contracting with non-CMS payers that *offer* capitated payments, the practice *received* capitated payments for their CPC+ patients from these payers in [the prior year][f]									
	Yes	n.a.	n.a.	68%	n.a.	n.a.	65%	n.a.	n.a.	70%
	No	n.a.	n.a.	32%	n.a.	n.a.	35%	n.a.	n.a.	30%
	N	n.a.	n.a.	484	n.a.	n.a.	181	n.a.	n.a.	303
Among practices receiving capitated payments from non-CMS payers…										
D7a	...Practice has detailed information from these payers on how they calculate the capitated payments									
	Strongly agree	n.a.	n.a.	9%	n.a.	n.a.	13%	n.a.	n.a.	8%
	Agree	n.a.	n.a.	58%	n.a.	n.a.	41%	n.a.	n.a.	68%
	Disagree	n.a.	n.a.	16%	n.a.	n.a.	23%	n.a.	n.a.	13%
	Strongly disagree	n.a.	n.a.	3%	n.a.	n.a.	3%	n.a.	n.a.	4%
	Don't know	n.a.	n.a.	12%	n.a.	n.a.	21%	n.a.	n.a.	8%
	N	n.a.	n.a.	329	n.a.	n.a.	117	n.a.	n.a.	212
D7b	...Practice understands how these payers calculate the capitated payments									
	Strongly agree	n.a.	n.a.	9%	n.a.	n.a.	12%	n.a.	n.a.	7%
	Agree	n.a.	n.a.	62%	n.a.	n.a.	46%	n.a.	n.a.	70%
	Disagree	n.a.	n.a.	23%	n.a.	n.a.	37%	n.a.	n.a.	16%
	Strongly disagree	n.a.	n.a.	6%	n.a.	n.a.	5%	n.a.	n.a.	6%
	N	n.a.	n.a.	324	n.a.	n.a.	114	n.a.	n.a.	210
D7c	...Practice feels that these payers' methodology is fair in how they determine the capitated payments									
	Strongly agree	n.a.	n.a.	7%	n.a.	n.a.	11%	n.a.	n.a.	4%
	Agree	n.a.	n.a.	33%	n.a.	n.a.	32%	n.a.	n.a.	33%
	Disagree	n.a.	n.a.	23%	n.a.	n.a.	15%	n.a.	n.a.	27%
	Strongly disagree	n.a.	n.a.	4%	n.a.	n.a.	3%	n.a.	n.a.	4%
	Don't know	n.a.	n.a.	34%	n.a.	n.a.	39%	n.a.	n.a.	31%
	N	n.a.	n.a.	329	n.a.	n.a.	117	n.a.	n.a.	212
Payments for performance for commercially insured patients (Not-CMS/Medicare FFS)										
D9	Practice contracted with non-CMS payers that offered CPC+ payments for performance in [the prior year]									
	Yes	n.a.	n.a.	71%	n.a.	n.a.	70%	n.a.	n.a.	71%
	No	n.a.	n.a.	29%	n.a.	n.a.	30%	n.a.	n.a.	29%
	N	n.a.	n.a.	2,129	n.a.	n.a.	943	n.a.	n.a.	1,186

Table 3.B.5a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
D10	Among practices that contracted with non-CMS payers that offered CPC+ payments for performance, percentage of these payers that provided the practice with the methodology they use to calculate CPC+ payments for performance									
	Mean	n.a.	n.a.	64.99	n.a.	n.a.	66.67	n.a.	n.a.	63.73
	Median	n.a.	n.a.	100	n.a.	n.a.	100	n.a.	n.a.	100
	N	n.a.	n.a.	2,040	n.a.	n.a.	875	n.a.	n.a.	1,165
Among practices receiving methodologies payers use to calculate CPC+ payments for performance…										
D11a	...Practice has detailed information from these payers on how they calculate the CPC+ payments for performance									
	Strongly agree	n.a.	n.a.	9%	n.a.	n.a.	9%	n.a.	n.a.	8%
	Agree	n.a.	n.a.	68%	n.a.	n.a.	68%	n.a.	n.a.	68%
	Disagree	n.a.	n.a.	10%	n.a.	n.a.	12%	n.a.	n.a.	9%
	Strongly disagree	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	2%
	Don't know	n.a.	n.a.	12%	n.a.	n.a.	10%	n.a.	n.a.	13%
	N	n.a.	n.a.	1,246	n.a.	n.a.	539	n.a.	n.a.	707
D11b	...Practice understands how these payers calculate the CPC+ payments for performance									
	Strongly agree	n.a.	n.a.	8%	n.a.	n.a.	8%	n.a.	n.a.	8%
	Agree	n.a.	n.a.	77%	n.a.	n.a.	75%	n.a.	n.a.	78%
	Disagree	n.a.	n.a.	13%	n.a.	n.a.	16%	n.a.	n.a.	11%
	Strongly disagree	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	3%
	N	n.a.	n.a.	1,229	n.a.	n.a.	527	n.a.	n.a.	702
D11c	...Practice feels that these payers' methodology is fair in how they determine the CPC+ payments for performance									
	Strongly agree	n.a.	n.a.	3%	n.a.	n.a.	4%	n.a.	n.a.	3%
	Agree	n.a.	n.a.	55%	n.a.	n.a.	56%	n.a.	n.a.	55%
	Disagree	n.a.	n.a.	22%	n.a.	n.a.	23%	n.a.	n.a.	21%
	Strongly disagree	n.a.	n.a.	4%	n.a.	n.a.	2%	n.a.	n.a.	5%
	Don't know	n.a.	n.a.	16%	n.a.	n.a.	14%	n.a.	n.a.	16%
	N	n.a.	n.a.	1,246	n.a.	n.a.	539	n.a.	n.a.	707

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions, these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

Table 3.B.5a *(continued)*

[b] Practices participating in the Medicare Shared Savings Program (SSP) every year 2018-2020 did not receive the Performance-Based Incentive Payment (PBIP) for any of those years and therefore were not asked these questions.

[c] The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP. Track 1 practices do not receive CPCPs and therefore were not asked these questions.

[d] The question changed significantly between PY 3 and PY 4. In PY 3, the question asked if the practice contracted with payer partners. In PY 4, the question asked which specific payers the practice contracted with. PY 4 responses are counted as a “yes” response in this table if any of the payers were selected.

[e] Practices were asked to consider this question across all payers they contracted with for CPC+, even if they did not provide a separate CPC+ payment.

[f] Practices were asked to not include care management fees and Performance-based Incentive Payments, as they are not replacements for fee-for-service payments.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; PY = Program Year).

Table 3.B.5b. Practice payments, overall by track and SSP status (2017 Starters)

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Sources of practice revenue and physician compensation													
C1	Percentage of practice site's revenue that came from fee-for-service (FFS) payments in [the prior year]												
	Mean	76.45	78.58	80.40	79.10	78.33	79.47	78.65	79.90	74.91	73.67	72.41	69.86
	Median	90	90	90	90	86	87	85	84	85	80	79	77
	N	551	558	570	515	517	520	542	604	607	706	690	703
CPC+ payments from Medicare FFS													
D1	Considering the amount of work required by CPC+, the adequacy of the CPC+ payments from Medicare FFS												
	More than adequate	1%	2%	2%	1%	2%	2%	1%	1%	5%	<1%	1%	1%
	Adequate	41%	40%	50%	40%	42%	48%	48%	60%	53%	54%	49%	59%
	Less than adequate	45%	47%	41%	50%	47%	43%	41%	36%	39%	37%	42%	31%
	Don't know – not familiar with CPC+ payments from Medicare FFS or costs of doing CPC+ work	14%	11%	7%	9%	9%	7%	10%	3%	3%	9%	9%	8%
	N	590	591	593	533	531	534	606	616	613	721	718	717
The Performance-Based Incentive Payment (PBIP) is paid prospectively by CMS at the beginning of each program year[b]…													
D2a	...Practice understands how Medicare FFS calculates the proportion of the PBIP the practice will retain and the proportion CMS recoups												
	Strongly agree	7%	19%	12%	10%	13%	25%	12%	19%	8%	10%	17%	21%
	Agree	49%	47%	88%	60%	64%	64%	59%	63%	91%	65%	67%	69%
	Disagree	30%	21%	0%	26%	19%	10%	19%	12%	2%	22%	15%	9%
	Strongly disagree	15%	13%	0%	4%	4%	1%	10%	7%	0%	3%	1%	1%
	N	101	120	59	409	439	513	193	241	129	567	673	715
D2b	...Practice feels that Medicare FFS's methodology is fair in how it determines the proportion of the PBIP the practice retains and the proportion CMS recoups												
	Strongly agree	5%	15%	7%	2%	5%	7%	1%	5%	3%	4%	4%	4%
	Agree	42%	41%	68%	42%	46%	55%	43%	50%	52%	43%	46%	57%
	Disagree	16%	21%	20%	18%	25%	24%	17%	10%	35%	21%	34%	24%
	Strongly disagree	14%	12%	0%	5%	7%	6%	18%	10%	2%	2%	3%	4%
	Don't know	23%	10%	5%	34%	17%	9%	21%	25%	8%	30%	13%	11%
	N	105	121	60	416	444	515	192	248	128	578	687	723

Table 3.B.5b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
The Comprehensive Primary Care Payment (CPCP) is paid quarterly as a lump sum to Track 2 practices for evaluation and management services[c]…													
D3a	...Practice understands how Medicare FFS calculated its CPCPs												
	Strongly agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	14%	26%	17%	10%	13%	15%
	Agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	63%	60%	72%	66%	62%	66%
	Disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	19%	13%	11%	22%	24%	17%
	Strongly disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4%	1%	1%	2%	1%	2%
	N	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	585	600	591	687	695	704
D3b	...Practice feels that Medicare FFS's methodology is fair in how it calculates CPCPs												
	Strongly agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7%	11%	6%	2%	1%	5%
	Agree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	55%	59%	68%	50%	50%	61%
	Disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16%	18%	12%	21%	26%	13%
	Strongly disagree	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3%	2%	1%	2%	7%	8%
	Don't know	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	18%	9%	13%	26%	16%	13%
	N	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	607	612	614	721	718	722
CPC+ payments from CPC+ payer partners (Not Medicare FFS)													
D4	Practice contracts with CPC+ payer partners (payers other than Medicare FFS) for CPC+[d]												
	Yes	74%	68%	81%	78%	76%	90%	83%	87%	90%	82%	80%	90%
	No	26%	32%	19%	22%	24%	10%	17%	13%	10%	18%	20%	10%
	N	582	590	593	520	530	534	602	612	616	722	718	722
D5	Among practices that contract with CPC+ payer partners for CPC+, considering the amount of work required by CPC+, the adequacy of the CPC+ payments from CPC+ payer partners[e]												
	More than adequate	<1%	2%	1%	1%	1%	1%	<1%	<1%	4%	0%	3%	1%
	Adequate	26%	29%	41%	32%	41%	39%	35%	44%	40%	30%	38%	43%
	Less than adequate	58%	51%	42%	54%	46%	45%	54%	51%	37%	59%	49%	44%
	Don't know – not familiar with CPC+ payments from CPC+ payer partners or costs of doing CPC+ work	16%	18%	15%	13%	11%	15%	11%	4%	19%	10%	10%	12%
	N	432	403	478	410	402	479	502	538	550	593	572	649

Table 3.B.5b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
CPC+ capitated payments from CPC+ payer partners (Not CMS/Medicare FFS)													
D6	Among practices contracting with non-CMS payers that *offer* capitated payments, the practice *received* capitated payments for their CPC+ patients from these payers in [the prior year][f]												
	Yes	n.a.	n.a.	64%	n.a.	n.a.	66%	n.a.	n.a.	82%	n.a.	n.a.	64%
	No	n.a.	n.a.	36%	n.a.	n.a.	34%	n.a.	n.a.	18%	n.a.	n.a.	36%
	N	n.a.	n.a.	96	n.a.	n.a.	85	n.a.	n.a.	98	n.a.	n.a.	205
Among practices receiving capitated payments from non-CMS payers…													
D7a	...Practice has detailed information from these payers on how they calculate the capitated payments												
	Strongly agree	n.a.	n.a.	13%	n.a.	n.a.	13%	n.a.	n.a.	6%	n.a.	n.a.	8%
	Agree	n.a.	n.a.	36%	n.a.	n.a.	46%	n.a.	n.a.	88%	n.a.	n.a.	56%
	Disagree	n.a.	n.a.	18%	n.a.	n.a.	29%	n.a.	n.a.	3%	n.a.	n.a.	19%
	Strongly disagree	n.a.	n.a.	2%	n.a.	n.a.	4%	n.a.	n.a.	3%	n.a.	n.a.	5%
	Don't know	n.a.	n.a.	31%	n.a.	n.a.	9%	n.a.	n.a.	1%	n.a.	n.a.	12%
	N	n.a.	n.a.	61	n.a.	n.a.	56	n.a.	n.a.	80	n.a.	n.a.	132
D7b	...Practice understands how these payers calculate the capitated payments												
	Strongly agree	n.a.	n.a.	13%	n.a.	n.a.	11%	n.a.	n.a.	8%	n.a.	n.a.	7%
	Agree	n.a.	n.a.	40%	n.a.	n.a.	52%	n.a.	n.a.	85%	n.a.	n.a.	62%
	Disagree	n.a.	n.a.	42%	n.a.	n.a.	31%	n.a.	n.a.	5%	n.a.	n.a.	23%
	Strongly disagree	n.a.	n.a.	5%	n.a.	n.a.	6%	n.a.	n.a.	3%	n.a.	n.a.	8%
	N	n.a.	n.a.	60	n.a.	n.a.	54	n.a.	n.a.	80	n.a.	n.a.	130
D7c	...Practice feels that these payers' methodology is fair in how they determine the capitated payments												
	Strongly agree	n.a.	n.a.	13%	n.a.	n.a.	9%	n.a.	n.a.	6%	n.a.	n.a.	3%
	Agree	n.a.	n.a.	23%	n.a.	n.a.	41%	n.a.	n.a.	10%	n.a.	n.a.	48%
	Disagree	n.a.	n.a.	13%	n.a.	n.a.	18%	n.a.	n.a.	49%	n.a.	n.a.	14%
	Strongly disagree	n.a.	n.a.	2%	n.a.	n.a.	4%	n.a.	n.a.	3%	n.a.	n.a.	5%
	Don't know	n.a.	n.a.	49%	n.a.	n.a.	29%	n.a.	n.a.	33%	n.a.	n.a.	30%
	N	n.a.	n.a.	61	n.a.	n.a.	56	n.a.	n.a.	80	n.a.	n.a.	132
Payments for performance for commercially insured patients (Not-CMS/Medicare FFS)													
D9	Practice contracted with non-CMS payers that offered CPC+ payments for performance in [the prior year]												
	Yes	n.a.	n.a.	71%	n.a.	n.a.	69%	n.a.	n.a.	67%	n.a.	n.a.	75%
	No	n.a.	n.a.	29%	n.a.	n.a.	31%	n.a.	n.a.	33%	n.a.	n.a.	25%

Table 3.B.5b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	N	n.a.	n.a.	471	n.a.	n.a.	472	n.a.	n.a.	545	n.a.	n.a.	641
D10	Among practices that contracted with non-CMS payers that offered CPC+ payments for performance, percentage of these payers that provided the practice with the methodology they use to calculate CPC+ payments for performance												
	Mean	n.a.	n.a.	66.39	n.a.	n.a.	66.96	n.a.	n.a.	58.28	n.a.	n.a.	68.40
	Median	n.a.	n.a.	100	n.a.	n.a.	100	n.a.	n.a.	75	n.a.	n.a.	100
	N	n.a.	n.a.	446	n.a.	n.a.	429	n.a.	n.a.	537	n.a.	n.a.	628
Among practices receiving methodologies payers use to calculate CPC+ payments for performance…													
D11a	...Practice has detailed information from these payers on how they calculate the CPC+ payments for performance												
	Strongly agree	n.a.	n.a.	9%	n.a.	n.a.	9%	n.a.	n.a.	6%	n.a.	n.a.	10%
	Agree	n.a.	n.a.	70%	n.a.	n.a.	66%	n.a.	n.a.	61%	n.a.	n.a.	73%
	Disagree	n.a.	n.a.	10%	n.a.	n.a.	13%	n.a.	n.a.	13%	n.a.	n.a.	6%
	Strongly disagree	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	2%
	Don’t know	n.a.	n.a.	9%	n.a.	n.a.	11%	n.a.	n.a.	19%	n.a.	n.a.	9%
	N	n.a.	n.a.	254	n.a.	n.a.	285	n.a.	n.a.	286	n.a.	n.a.	421
D11b	...Practice understands how these payers calculate the CPC+ payments for performance												
	Strongly agree	n.a.	n.a.	8%	n.a.	n.a.	8%	n.a.	n.a.	5%	n.a.	n.a.	10%
	Agree	n.a.	n.a.	77%	n.a.	n.a.	73%	n.a.	n.a.	84%	n.a.	n.a.	75%
	Disagree	n.a.	n.a.	14%	n.a.	n.a.	18%	n.a.	n.a.	9%	n.a.	n.a.	13%
	Strongly disagree	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	3%
	N	n.a.	n.a.	248	n.a.	n.a.	279	n.a.	n.a.	285	n.a.	n.a.	417
D11c	...Practice feels that these payers’ methodology is fair in how they determine the CPC+ payments for performance												
	Strongly agree	n.a.	n.a.	5%	n.a.	n.a.	4%	n.a.	n.a.	2%	n.a.	n.a.	3%
	Agree	n.a.	n.a.	60%	n.a.	n.a.	53%	n.a.	n.a.	50%	n.a.	n.a.	58%
	Disagree	n.a.	n.a.	19%	n.a.	n.a.	27%	n.a.	n.a.	23%	n.a.	n.a.	20%
	Strongly disagree	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	5%	n.a.	n.a.	5%
	Don’t know	n.a.	n.a.	15%	n.a.	n.a.	14%	n.a.	n.a.	20%	n.a.	n.a.	14%
	N	n.a.	n.a.	254	n.a.	n.a.	285	n.a.	n.a.	287	n.a.	n.a.	420

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions, these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

Table 3.B.5b *(continued)*

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

[b] Practices participating in the Medicare Shared Savings Program (SSP) every year 2018-2020 did not receive the Performance-Based Incentive Payment (PBIP) for any of those years and therefore were not asked these questions.

[c] The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP. Track 1 practices do not receive CPCPs and therefore were not asked these questions.

[d] The question changed significantly between PY 3 and PY 4. In PY 3, the question asked if the practice contracted with payer partners. In PY 4, the question asked which specific payers the practice contracted with. PY 4 responses are counted as a “yes” response in this table if any of the payers were selected.

[e] Practices were asked to consider this question across all payers they contracted with for CPC+, even if they did not provide a separate CPC+ payment.

[f] Practices were asked to not include care management fees and Performance-based Incentive Payments, as they are not replacements for fee-for-service payments.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; PY = Program Year; SSP = Medicare Shared Savings Program (reflects 2020 [PY4] participation, or, for practices that withdrew from CPC+, their participation at the time of withdrawal).

Table 3.B.6a. CPC+ practices' perceptions of CPC+ supports, overall by track (2017 Starters)

Question[a]		Combined tracks			Track 1 Overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
CPC+ learning activities and assistance										
E1	Rating of services from regional learning network organizations in meeting practice site's CPC+-related needs and helping improve primary care									
	Excellent	17%	17%	22%	16%	13%	19%	18%	20%	25%
	Very good	29%	29%	31%	30%	32%	33%	28%	26%	29%
	Good	37%	38%	33%	38%	36%	32%	36%	40%	34%
	Fair	15%	14%	11%	14%	17%	14%	16%	12%	9%
	Poor	2%	1%	2%	2%	2%	2%	2%	1%	3%
	N	2,453	2,453	2,451	1,119	1,121	1,122	1,334	1,332	1,329
Rating of usefulness of assistance received in the past six months from the CPC+ national learning community and regional learning network in improving primary care…										
E2a	...Webinars[b]									
	Very useful	25%	26%	19%	29%	28%	22%	22%	24%	17%
	Somewhat useful	54%	55%	39%	48%	52%	36%	60%	58%	42%
	Not very useful	10%	8%	8%	9%	8%	7%	11%	8%	9%
	Not at all useful	1%	1%	2%	1%	1%	1%	1%	2%	2%
	Never received or attended	9%	10%	32%	14%	12%	35%	6%	8%	29%
	N	2,461	2,450	2,366	1,129	1,121	1,077	1,332	1,329	1,289
E2b	...One-on-one telephone/virtual coaching with the practice site to improve practice processes and workflows									
	Very useful	35%	35%	40%	36%	38%	42%	34%	32%	38%
	Somewhat useful	23%	27%	21%	21%	25%	18%	25%	29%	23%
	Not very useful	7%	5%	4%	5%	5%	3%	9%	5%	5%
	Not at all useful	3%	1%	1%	3%	1%	1%	2%	1%	1%
	Never received or attended	32%	32%	34%	36%	31%	36%	29%	33%	33%
	N	2,452	2,447	2,450	1,120	1,124	1,117	1,332	1,323	1,333
E2c	...CPC+ Connect									
	Very useful	40%	42%	41%	43%	42%	44%	38%	43%	39%
	Somewhat useful	44%	41%	44%	39%	39%	40%	48%	43%	47%
	Not very useful	8%	8%	7%	9%	9%	7%	7%	7%	8%
	Not at all useful	2%	3%	2%	2%	3%	2%	2%	2%	1%
	Never received or attended	6%	6%	6%	7%	7%	7%	6%	5%	6%
	N	2,455	2,450	2,458	1,121	1,125	1,123	1,334	1,325	1,335
E2d	...CPC+ Implementation Guides									
	Very useful	58%	61%	60%	53%	58%	57%	62%	63%	63%
	Somewhat useful	33%	31%	30%	35%	32%	33%	30%	30%	28%
	Not very useful	5%	4%	4%	7%	4%	4%	3%	3%	4%
	Not at all useful	<1%	1%	<1%	<1%	1%	1%	<1%	1%	<1%
	Never received or attended	5%	4%	6%	4%	4%	6%	5%	3%	5%
	N	2,455	2,446	2,453	1,123	1,122	1,118	1,332	1,324	1,335
E2e	...CPC+ Support									
	Very useful	53%	64%	61%	49%	63%	58%	56%	64%	63%
	Somewhat useful	31%	23%	24%	33%	22%	25%	29%	24%	23%

Table 3.B.6a *(continued)*

Question[a]		Combined tracks			Track 1 Overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	Not very useful	5%	4%	3%	6%	4%	3%	3%	3%	3%
	Not at all useful	1%	1%	1%	1%	1%	1%	2%	1%	1%
	Never received or attended	11%	9%	12%	11%	9%	13%	10%	8%	11%
	N	2,459	2,445	2,456	1,125	1,121	1,120	1,334	1,324	1,336
E2f	...Group coaching									
	Very useful	n.a.	n.a.	22%	n.a.	n.a.	25%	n.a.	n.a.	20%
	Somewhat useful	n.a.	n.a.	22%	n.a.	n.a.	21%	n.a.	n.a.	24%
	Not very useful	n.a.	n.a.	5%	n.a.	n.a.	6%	n.a.	n.a.	5%
	Not at all useful	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	1%
	Never received or attended	n.a.	n.a.	49%	n.a.	n.a.	46%	n.a.	n.a.	50%
	N	n.a.	n.a.	2,457	n.a.	n.a.	1,124	n.a.	n.a.	1,333
CPC+ payer partner support and assistance										
Rating of usefulness of assistance received in the past six months from CPC+ payer partners in improving primary care[c]...										
E3a	...On-site care manager provided by the payer									
	Very useful	8%	11%	8%	10%	12%	8%	7%	9%	8%
	Somewhat useful	7%	10%	9%	7%	11%	10%	7%	10%	9%
	Not very useful	2%	2%	2%	2%	2%	1%	2%	3%	3%
	Not at all useful	1%	1%	2%	1%	<1%	1%	1%	1%	3%
	Never received or attended	81%	76%	78%	79%	75%	79%	83%	78%	77%
	N	1,952	1,913	2,145	860	807	946	1,092	1,106	1,199
E3b	...Telephone-based care manager provided by the payer									
	Very useful	9%	10%	9%	8%	9%	9%	10%	11%	9%
	Somewhat useful	14%	19%	18%	13%	18%	15%	15%	19%	19%
	Not very useful	5%	8%	9%	5%	9%	10%	6%	7%	8%
	Not at all useful	2%	2%	3%	2%	1%	2%	2%	4%	4%
	Never received or attended	70%	60%	61%	72%	63%	64%	68%	58%	59%
	N	1,950	1,884	2,138	860	803	943	1,090	1,081	1,195
E3c	...Explanation of payers' CPC+ payment methodologies									
	Very useful	12%	12%	15%	14%	12%	14%	11%	12%	16%
	Somewhat useful	30%	34%	33%	29%	32%	34%	30%	37%	32%
	Not very useful	8%	11%	8%	8%	13%	8%	9%	10%	8%
	Not at all useful	2%	2%	3%	2%	4%	1%	2%	1%	3%
	Never received or attended	48%	40%	41%	47%	40%	42%	49%	41%	41%
	N	1,952	1,909	2,139	858	805	945	1,094	1,104	1,194
E3d	...Training on how to access data feedback provided by the payer									
	Very useful	14%	14%	19%	16%	16%	19%	13%	12%	18%
	Somewhat useful	33%	40%	32%	29%	32%	29%	36%	45%	34%
	Not very useful	7%	7%	7%	10%	10%	7%	5%	5%	6%
	Not at all useful	1%	3%	2%	1%	3%	1%	1%	3%	2%
	Never received or attended	44%	37%	41%	44%	39%	43%	44%	35%	40%
	N	1,951	1,911	2,143	859	805	945	1,092	1,106	1,198
E3e	...Training on how to use data feedback provided by the payer									
	Very useful	14%	13%	16%	16%	15%	16%	13%	12%	17%

Table 3.B.6a *(continued)*

Question[a]		Combined tracks			Track 1 Overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	Somewhat useful	31%	38%	33%	30%	34%	31%	32%	40%	34%
	Not very useful	7%	9%	8%	8%	11%	9%	6%	8%	7%
	Not at all useful	2%	3%	2%	2%	2%	1%	2%	3%	2%
	Never received or attended	46%	37%	41%	44%	38%	43%	47%	37%	39%
	N	1,952	1,912	2,143	861	805	945	1,091	1,107	1,198
E3f	...Coaching on how to improve practice processes and workflows									
	Very useful	12%	16%	15%	15%	16%	16%	9%	16%	14%
	Somewhat useful	26%	29%	28%	25%	28%	28%	27%	30%	29%
	Not very useful	9%	8%	7%	9%	9%	5%	9%	8%	8%
	Not at all useful	2%	4%	3%	2%	3%	3%	2%	4%	4%
	Never received or attended	51%	44%	47%	50%	44%	48%	53%	43%	45%
	N	1,950	1,910	2,143	858	803	945	1,092	1,107	1,198
Usefulness of CPC+ supports in improving primary care (supports from all payers)										
F6a	Financial support									
	Very useful	49%	50%	58%	46%	49%	56%	51%	52%	60%
	Somewhat useful	30%	35%	31%	30%	34%	32%	30%	36%	30%
	Not very useful	8%	5%	4%	10%	7%	6%	6%	3%	3%
	Not at all useful	1%	1%	<1%	1%	1%	<1%	1%	1%	<1%
	Don't know	12%	9%	6%	12%	9%	5%	12%	8%	7%
	N	2,459	2,452	2,460	1,126	1,119	1,124	1,333	1,333	1,336
F6b	Learning support									
	Very useful	33%	33%	35%	34%	33%	35%	31%	32%	34%
	Somewhat useful	55%	57%	54%	51%	54%	52%	58%	59%	56%
	Not very useful	6%	6%	6%	7%	7%	8%	5%	5%	4%
	Not at all useful	1%	<1%	1%	1%	1%	1%	1%	<1%	1%
	Don't know	6%	4%	5%	6%	5%	4%	5%	4%	5%
	N	2,460	2,456	2,459	1,126	1,119	1,124	1,334	1,337	1,335
F6c	Data feedback									
	Very useful	36%	33%	33%	36%	34%	33%	36%	32%	34%
	Somewhat useful	47%	52%	48%	46%	50%	49%	47%	53%	47%
	Not very useful	10%	10%	12%	11%	10%	12%	10%	11%	13%
	Not at all useful	1%	1%	2%	2%	1%	3%	1%	1%	2%
	Don't know	5%	4%	4%	6%	5%	4%	5%	3%	5%
	N	2,459	2,460	2,459	1,128	1,121	1,123	1,331	1,339	1,336
F6d	Health IT vendor support									
	Very useful	17%	19%	19%	16%	19%	19%	19%	18%	19%
	Somewhat useful	35%	39%	36%	32%	35%	35%	37%	43%	36%
	Not very useful	22%	18%	15%	22%	19%	15%	22%	16%	15%
	Not at all useful	5%	6%	9%	8%	5%	9%	3%	7%	8%
	Don't know	21%	18%	22%	22%	22%	22%	20%	15%	21%
	N	2,461	2,457	2,458	1,128	1,120	1,124	1,333	1,337	1,334

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Table 3.B.6a *(continued)*

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

[b] Question wording changed between PY 3 and PY 4. In PY 3, it asked about any webinars, but in PY 4 it specified national webinars.

[c] The screening survey question (D4), which determined which practices received question E3, changed between PY 3 and PY 4. In PYs 2 and 3, it asked if practices contracted with CPC+ payer partners. If practices selected "no", they were not asked E3. In PY 4, the screener question asked practices to select the payer partners they contracted with. If practices did not select any payer partners, they were not asked E3. These changes in the wording of the screening question resulted in slightly more practices being asked E3 in PY 4 compared to previous PYs.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive question; PY = Program Year.

Table 3.B.6b. CPC+ practices' perceptions of CPC+ supports, overall by track and SSP status (2017 Starters)

Question[a]		Track 1 – SSP			Track 1 – Not-SSP			Track 2 – SSP			Track 2 – Not-SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
CPC+ learning activities and assistance													
E1	Rating of services from regional learning network organizations in meeting practice site's CPC+-related needs and helping improve primary care												
	Excellent	21%	10%	18%	10%	16%	20%	15%	22%	33%	20%	19%	19%
	Very good	28%	33%	37%	33%	31%	28%	30%	26%	31%	28%	27%	28%
	Good	36%	38%	29%	41%	34%	35%	37%	42%	31%	36%	39%	36%
	Fair	14%	18%	13%	14%	16%	15%	17%	10%	5%	14%	14%	13%
	Poor	1%	2%	3%	2%	2%	2%	1%	1%	<1%	2%	1%	4%
	N	586	592	592	533	529	530	615	614	615	719	718	714
Rating of usefulness of assistance received in the past six months from the CPC+ national learning community and regional learning network in improving primary care…													
E2a	...Webinars[b]												
	Very useful	33%	26%	23%	24%	31%	21%	22%	26%	19%	22%	23%	16%
	Somewhat useful	46%	54%	38%	49%	49%	34%	66%	61%	45%	55%	56%	40%
	Not very useful	7%	6%	4%	12%	10%	9%	7%	6%	6%	15%	10%	11%
	Not at all useful	<1%	<1%	1%	1%	1%	1%	<1%	2%	2%	2%	1%	3%
	Never received or attended	13%	14%	34%	14%	9%	36%	5%	6%	28%	6%	10%	31%
	N	594	592	567	535	529	510	613	611	598	719	718	691
E2b	...One-on-one telephone/virtual coaching with the practice site to improve practice processes and workflows												
	Very useful	44%	38%	44%	27%	39%	40%	39%	35%	42%	30%	30%	34%
	Somewhat useful	20%	27%	17%	22%	23%	18%	29%	38%	23%	22%	22%	24%
	Not very useful	5%	3%	4%	4%	6%	2%	13%	1%	4%	6%	9%	6%
	Not at all useful	1%	1%	2%	5%	1%	1%	<1%	<1%	1%	4%	1%	2%
	Never received or attended	30%	30%	33%	42%	32%	39%	20%	26%	30%	37%	39%	35%
	N	588	593	589	532	531	528	610	607	612	722	716	721
E2c	...CPC+ Connect												
	Very useful	47%	45%	50%	38%	38%	37%	40%	45%	39%	36%	41%	38%
	Somewhat useful	38%	34%	35%	40%	45%	46%	49%	41%	48%	47%	44%	46%
	Not very useful	5%	9%	6%	14%	9%	8%	6%	4%	7%	8%	9%	8%
	Not at all useful	1%	3%	3%	3%	3%	2%	2%	4%	1%	2%	1%	1%
	Never received or attended	9%	9%	6%	4%	5%	7%	4%	5%	5%	7%	5%	7%
	N	588	594	589	533	531	534	612	610	614	722	715	721

Table 3.B.6b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not-SSP			Track 2 – SSP			Track 2 – Not-SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
E2d	...CPC+ Implementation Guides												
	Very useful	54%	62%	61%	52%	54%	52%	68%	72%	67%	57%	56%	59%
	Somewhat useful	36%	30%	29%	35%	35%	37%	24%	23%	23%	35%	35%	31%
	Not very useful	5%	3%	3%	9%	6%	4%	3%	1%	6%	3%	5%	3%
	Not at all useful	<1%	1%	1%	1%	1%	1%	<1%	1%	<1%	<1%	<1%	<1%
	Never received or attended	5%	5%	6%	3%	4%	7%	4%	2%	3%	5%	4%	7%
	N	590	593	588	533	529	530	613	610	615	719	714	720
E2e	...CPC+ Support												
	Very useful	48%	63%	59%	50%	64%	57%	62%	74%	72%	50%	55%	55%
	Somewhat useful	33%	23%	26%	33%	21%	24%	26%	20%	17%	31%	29%	28%
	Not very useful	7%	3%	3%	6%	5%	3%	2%	1%	4%	3%	5%	3%
	Not at all useful	1%	<1%	1%	1%	1%	<1%	<1%	1%	<1%	3%	1%	1%
	Never received or attended	12%	11%	11%	10%	8%	16%	9%	6%	7%	12%	10%	14%
	N	590	590	588	535	531	532	613	610	615	721	714	721
E2f	...Group coaching												
	Very useful	n.a.	n.a.	25%	n.a.	n.a.	26%	n.a.	n.a.	24%	n.a.	n.a.	16%
	Somewhat useful	n.a.	n.a.	19%	n.a.	n.a.	22%	n.a.	n.a.	20%	n.a.	n.a.	27%
	Not very useful	n.a.	n.a.	7%	n.a.	n.a.	5%	n.a.	n.a.	4%	n.a.	n.a.	5%
	Not at all useful	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	2%
	Never received or attended	n.a.	n.a.	47%	n.a.	n.a.	46%	n.a.	n.a.	51%	n.a.	n.a.	50%
	N	n.a.	n.a.	591	n.a.	n.a.	533	n.a.	n.a.	614	n.a.	n.a.	719
CPC+ payer partner support and assistance													
Rating of usefulness of assistance received in the past six months from CPC+ payer partners in improving primary care[c]…													
E3a	...On-site care manager provided by the payer												
	Very useful	7%	9%	8%	13%	16%	9%	6%	11%	6%	8%	8%	10%
	Somewhat useful	8%	9%	10%	6%	12%	10%	8%	7%	9%	6%	12%	8%
	Not very useful	2%	1%	1%	3%	2%	2%	1%	2%	2%	3%	3%	4%
	Not at all useful	2%	1%	1%	<1%	0%	2%	1%	<1%	4%	1%	1%	2%
	Never received or attended	80%	80%	80%	78%	70%	78%	85%	80%	78%	81%	75%	76%
	N	439	405	478	421	402	468	504	535	551	588	571	648
E3b	...Telephone-based care manager provided by the payer												
	Very useful	6%	5%	6%	10%	13%	11%	15%	17%	9%	5%	6%	9%
	Somewhat useful	15%	19%	16%	10%	17%	15%	18%	15%	23%	14%	23%	16%
	Not very useful	5%	11%	14%	5%	7%	5%	5%	6%	9%	6%	9%	7%
	Not at all useful	3%	1%	1%	1%	1%	3%	1%	3%	5%	2%	4%	4%

Table 3.B.6b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not-SSP			Track 2 – SSP			Track 2 – Not-SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
	Never received or attended	71%	64%	62%	74%	61%	67%	61%	59%	55%	73%	58%	63%
	N	439	401	476	421	402	467	503	514	549	587	567	646
E3c	...Explanation of payers' CPC+ payment methodologies												
	Very useful	14%	11%	9%	14%	12%	20%	12%	12%	14%	11%	11%	18%
	Somewhat useful	25%	21%	35%	33%	42%	33%	23%	30%	29%	36%	43%	36%
	Not very useful	6%	18%	8%	9%	7%	8%	4%	7%	8%	13%	13%	7%
	Not at all useful	2%	6%	1%	2%	2%	2%	1%	1%	6%	3%	2%	1%
	Never received or attended	53%	44%	47%	41%	37%	37%	62%	50%	43%	37%	32%	39%
	N	439	404	478	419	401	467	504	534	550	590	570	644
E3d	...Training on how to access data feedback provided by the payer												
	Very useful	14%	12%	16%	18%	21%	22%	13%	9%	19%	12%	15%	18%
	Somewhat useful	24%	31%	29%	34%	34%	30%	34%	49%	31%	39%	41%	36%
	Not very useful	10%	12%	8%	10%	8%	6%	2%	2%	7%	9%	8%	6%
	Not at all useful	1%	1%	1%	1%	4%	2%	2%	2%	4%	1%	4%	1%
	Never received or attended	51%	45%	46%	37%	32%	41%	50%	38%	40%	39%	32%	39%
	N	438	403	478	421	402	467	504	534	551	588	572	647
E3e	...Training on how to use data feedback provided by the payer												
	Very useful	14%	13%	14%	18%	18%	17%	14%	10%	16%	12%	14%	17%
	Somewhat useful	29%	29%	31%	32%	39%	32%	27%	41%	35%	36%	40%	34%
	Not very useful	5%	13%	8%	11%	9%	10%	2%	7%	7%	10%	9%	8%
	Not at all useful	1%	<1%	1%	2%	4%	2%	2%	2%	4%	2%	4%	1%
	Never received or attended	52%	46%	47%	37%	30%	39%	54%	41%	39%	41%	33%	40%
	N	440	403	478	421	402	467	502	535	551	589	572	647
E3f	...Coaching on how to improve practice processes and workflows												
	Very useful	13%	11%	15%	17%	20%	17%	7%	20%	14%	11%	11%	14%
	Somewhat useful	26%	28%	31%	23%	27%	25%	28%	21%	23%	26%	38%	33%
	Not very useful	4%	8%	3%	14%	11%	6%	5%	4%	5%	13%	11%	11%
	Not at all useful	2%	1%	1%	1%	4%	5%	2%	3%	4%	2%	5%	3%
	Never received or attended	55%	52%	50%	45%	37%	46%	59%	51%	54%	48%	35%	38%
	N	438	402	478	420	401	467	503	534	551	589	573	647

Table 3.B.6b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not-SSP			Track 2 – SSP			Track 2 – Not-SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Usefulness of CPC+ supports in improving primary care (supports from all payers)													
F6a	Financial support												
	Very useful	43%	46%	54%	50%	52%	58%	54%	52%	61%	49%	51%	59%
	Somewhat useful	31%	36%	32%	30%	32%	33%	31%	37%	33%	30%	34%	27%
	Not very useful	14%	8%	8%	6%	5%	3%	4%	3%	1%	7%	4%	4%
	Not at all useful	1%	1%	<1%	2%	1%	1%	1%	1%	<1%	1%	2%	1%
	Don't know	12%	9%	6%	12%	10%	4%	10%	7%	5%	14%	9%	9%
	N	592	591	591	534	528	533	610	612	616	723	721	720
F6b	Learning support												
	Very useful	36%	35%	36%	33%	32%	34%	31%	32%	37%	32%	33%	32%
	Somewhat useful	52%	56%	50%	51%	52%	53%	61%	62%	55%	55%	56%	56%
	Not very useful	6%	5%	9%	9%	10%	7%	4%	4%	2%	6%	6%	6%
	Not at all useful	1%	1%	1%	2%	1%	1%	<1%	0%	2%	1%	<1%	<1%
	Don't know	6%	3%	3%	6%	6%	5%	5%	2%	4%	6%	5%	6%
	N	592	592	591	534	527	533	611	615	614	723	722	721
F6c	Data feedback												
	Very useful	36%	30%	31%	36%	38%	35%	35%	25%	32%	38%	37%	36%
	Somewhat useful	47%	54%	49%	45%	47%	49%	48%	58%	46%	47%	49%	48%
	Not very useful	10%	11%	13%	12%	9%	10%	12%	13%	18%	9%	9%	8%
	Not at all useful	1%	2%	4%	2%	1%	1%	0%	2%	1%	1%	1%	2%
	Don't know	5%	4%	3%	6%	6%	5%	5%	2%	3%	6%	5%	6%
	N	593	592	590	535	529	533	610	616	615	721	723	721
F6d	Health IT vendor support												
	Very useful	15%	19%	17%	17%	19%	21%	22%	21%	19%	15%	16%	18%
	Somewhat useful	36%	38%	36%	28%	31%	33%	34%	43%	36%	40%	43%	37%
	Not very useful	19%	14%	12%	25%	25%	19%	21%	14%	8%	22%	18%	22%
	Not at all useful	5%	4%	9%	12%	6%	10%	2%	12%	10%	3%	3%	6%
	Don't know	25%	26%	26%	18%	19%	17%	21%	11%	26%	19%	19%	18%
	N	593	591	591	535	529	533	611	614	614	722	723	720

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

[b] Question wording changed between PY 3 and PY 4. In PY 3, it asked about any webinars, but in PY 4 it specified national webinars.

[c] The screening survey question (D4), which determined which practices received question E3, changed between PY 3 and PY 4. In PYs 2 and 3, it asked if practices contracted with CPC+ payer partners. If practices selected "no", they were not asked E3. In PY 4, the screener question asked practices to select the payer partners they contracted with. If practices did not select any payer partners, they were not asked E3. These changes in the wording of the screening question resulted in slightly more practices being asked E3 in PY 4 compared to previous PYs.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive question; PY = Program Year; SSP = Medicare Shared Savings Program (reflects 2020 [PY4] participation, or, for practices that withdrew from CPC+, their participation at the time of withdrawal).

Table 3.B.7a. CPC+ practices' experience with CPC+, overall by track (2017 Starters)

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Overall perception of CPC+										
F3	Given practice's overall experience in CPC+, likelihood practice would participate in CPC+ if practice could do it all over again									
	Very likely	66%	67%	66%	63%	60%	59%	68%	73%	72%
	Somewhat likely	28%	26%	28%	28%	32%	33%	27%	22%	23%
	Not very likely	5%	5%	4%	7%	6%	5%	4%	4%	3%
	Not at all likely	2%	2%	2%	2%	2%	2%	1%	1%	1%
	N	2,460	2,457	2,463	1,127	1,124	1,127	1,333	1,333	1,336
F4	The extent to which participation in CPC+ improved the quality of care that the practice provides to its patients									
	A lot	45%	54%	55%	42%	51%	53%	48%	57%	58%
	Somewhat	48%	41%	42%	48%	42%	43%	48%	40%	40%
	Not very much	6%	4%	3%	8%	6%	3%	4%	2%	2%
	Not at all	1%	<1%	<1%	1%	<1%	1%	1%	1%	<1%
	N	2,463	2,457	2,462	1,126	1,127	1,127	1,337	1,330	1,335
Staff involvement in implementing CPC+										
F1a	Medical director or clinician lead at the practice site									
	Very involved	63%	64%	62%	57%	59%	58%	68%	68%	65%
	Somewhat involved	29%	29%	31%	33%	33%	34%	26%	27%	29%
	Not very involved	6%	4%	5%	7%	5%	5%	4%	3%	5%
	Not at all involved	2%	3%	2%	3%	3%	3%	2%	2%	1%
	N	2,447	2,436	2,449	1,117	1,115	1,119	1,330	1,321	1,330
F1b	Physicians									
	Very involved	42%	44%	46%	38%	44%	46%	45%	45%	47%
	Somewhat involved	48%	48%	44%	50%	48%	44%	46%	49%	43%
	Not very involved	9%	6%	9%	10%	7%	9%	7%	6%	8%
	Not at all involved	1%	1%	2%	2%	2%	2%	1%	1%	1%
	N	2,456	2,447	2,447	1,125	1,122	1,120	1,331	1,325	1,327
F1c	Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)									
	Very involved	25%	26%	30%	19%	22%	25%	30%	30%	35%
	Somewhat involved	33%	36%	32%	35%	35%	31%	31%	37%	32%
	Not very involved	8%	6%	8%	9%	6%	9%	7%	6%	7%
	Not at all involved	2%	1%	1%	2%	2%	2%	2%	1%	1%
	No NPs/PAs/CNSs	33%	30%	29%	36%	35%	34%	30%	26%	25%
	N	2,459	2,462	2,462	1,124	1,127	1,127	1,335	1,335	1,335

Table 3.B.7a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F1d	Clinical support staff									
	Very involved	48%	54%	56%	42%	50%	53%	54%	57%	58%
	Somewhat involved	46%	40%	36%	51%	44%	37%	41%	37%	36%
	Not very involved	5%	6%	7%	6%	5%	8%	4%	6%	5%
	Not at all involved	1%	1%	1%	1%	1%	2%	1%	<1%	1%
	N	2,464	2,454	2,460	1,128	1,122	1,125	1,336	1,332	1,335
F1e	Clerical support staff									
	Very involved	37%	37%	39%	32%	35%	33%	42%	39%	43%
	Somewhat involved	47%	47%	42%	52%	48%	43%	42%	46%	42%
	Not very involved	13%	15%	15%	14%	15%	20%	13%	14%	11%
	Not at all involved	3%	2%	4%	3%	2%	4%	3%	1%	4%
	N	2,460	2,456	2,458	1,126	1,124	1,123	1,334	1,332	1,335
F2	System-level leadership (e.g., chief executive officer or chief medical officer)									
	Very involved	52%	48%	50%	42%	40%	40%	60%	55%	58%
	Somewhat involved	21%	25%	22%	24%	28%	24%	18%	23%	20%
	Not very involved	7%	6%	8%	9%	9%	11%	5%	4%	5%
	Not at all involved	2%	1%	2%	4%	1%	3%	1%	1%	2%
	Practice site is independent and not part of a system	18%	20%	18%	22%	23%	21%	16%	17%	15%
	N	2,463	2,449	2,465	1,125	1,120	1,127	1,338	1,329	1,338
Extent to which CPC+ requirements are burdensome										
F5a	Meeting care delivery requirements									
	Not at all burdensome	4%	6%	8%	4%	5%	6%	5%	7%	9%
	Not very burdensome	28%	29%	31%	31%	28%	28%	25%	30%	33%
	Somewhat burdensome	50%	51%	48%	46%	53%	53%	52%	49%	44%
	Very burdensome	17%	13%	12%	18%	13%	12%	16%	13%	11%
	Don't know	1%	1%	1%	2%	1%	1%	1%	1%	2%
	N	2,464	2,463	2,462	1,125	1,125	1,125	1,339	1,338	1,337
F5b	Completing care delivery reporting requirements									
	Not at all burdensome	4%	4%	5%	2%	3%	5%	5%	5%	5%
	Not very burdensome	20%	27%	27%	20%	26%	25%	20%	27%	28%
	Somewhat burdensome	49%	49%	46%	50%	49%	47%	48%	50%	44%
	Very burdensome	26%	18%	21%	27%	21%	21%	25%	16%	20%
	Don't know	2%	2%	2%	2%	1%	1%	2%	2%	3%
	N	2,465	2,465	2,461	1,126	1,125	1,126	1,339	1,340	1,335

Table 3.B.7a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F5c	Completing financial reporting requirements									
	Not at all burdensome	2%	2%	3%	1%	2%	2%	2%	2%	4%
	Not very burdensome	13%	16%	17%	13%	16%	15%	12%	15%	18%
	Somewhat burdensome	27%	33%	36%	25%	35%	39%	29%	32%	34%
	Very burdensome	48%	41%	37%	48%	38%	37%	47%	44%	37%
	Don't know	11%	8%	7%	13%	9%	6%	9%	7%	7%
	N	2,461	2,464	2,460	1,123	1,125	1,126	1,338	1,339	1,334
F5d	Meeting health IT requirements									
	Not at all burdensome	7%	12%	16%	7%	12%	15%	7%	13%	17%
	Not very burdensome	30%	35%	34%	32%	36%	32%	28%	35%	36%
	Somewhat burdensome	33%	34%	34%	31%	34%	40%	34%	34%	29%
	Very burdensome	20%	12%	10%	19%	10%	9%	21%	13%	11%
	Don't know	10%	7%	5%	11%	8%	4%	9%	6%	7%
	N	2,462	2,463	2,463	1,125	1,124	1,126	1,337	1,339	1,337
CPC+ and coronavirus pandemic										
F7	Practice was better positioned to meet patients' care needs during the coronavirus pandemic because of practice's participation in CPC+									
	Strongly agree	n.a.	n.a.	14%	n.a.	n.a.	7%	n.a.	n.a.	20%
	Agree	n.a.	n.a.	29%	n.a.	n.a.	29%	n.a.	n.a.	29%
	Neither agree nor disagree	n.a.	n.a.	46%	n.a.	n.a.	50%	n.a.	n.a.	43%
	Disagree	n.a.	n.a.	7%	n.a.	n.a.	9%	n.a.	n.a.	5%
	Strongly disagree	n.a.	n.a.	4%	n.a.	n.a.	4%	n.a.	n.a.	3%
	N	n.a.	n.a.	2,464	n.a.	n.a.	1,127	n.a.	n.a.	1,337
Sustainability of CPC+										
Among practices still participating in CPC+, how much of the practice's current process the practice is likely to maintain after CPC+ ends…										
F8a	...Risk stratify patients									
	Most or all of the process	n.a.	n.a.	66%	n.a.	n.a.	61%	n.a.	n.a.	69%
	A lot of the process	n.a.	n.a.	17%	n.a.	n.a.	18%	n.a.	n.a.	16%
	Some of the process	n.a.	n.a.	13%	n.a.	n.a.	15%	n.a.	n.a.	10%
	None of the process	n.a.	n.a.	2%	n.a.	n.a.	3%	n.a.	n.a.	1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	3%	n.a.	n.a.	3%	n.a.	n.a.	2%
	N	n.a.	n.a.	2,428	n.a.	n.a.	1,101	n.a.	n.a.	1,327

Table 3.B.7a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8b	...Provide short-term ("episodic") care management for patients who had a recent hospital admission or ED visit									
	Most or all of the process	n.a.	n.a.	72%	n.a.	n.a.	70%	n.a.	n.a.	73%
	A lot of the process	n.a.	n.a.	20%	n.a.	n.a.	22%	n.a.	n.a.	19%
	Some of the process	n.a.	n.a.	6%	n.a.	n.a.	7%	n.a.	n.a.	5%
	None of the process	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	3%
	N	n.a.	n.a.	2,430	n.a.	n.a.	1,102	n.a.	n.a.	1,328
F8c	...Work with a care manager to provide proactive, long-term, relationship-based ("longitudinal") care management									
	Most or all of the process	n.a.	n.a.	65%	n.a.	n.a.	65%	n.a.	n.a.	65%
	A lot of the process	n.a.	n.a.	20%	n.a.	n.a.	19%	n.a.	n.a.	20%
	Some of the process	n.a.	n.a.	11%	n.a.	n.a.	13%	n.a.	n.a.	10%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	3%	n.a.	n.a.	2%	n.a.	n.a.	4%
	N	n.a.	n.a.	2,443	n.a.	n.a.	1,113	n.a.	n.a.	1,330
F8d	...Use care plans for high-risk patients that reflect patient preferences, goals, and wishes									
	Most or all of the process	n.a.	n.a.	57%	n.a.	n.a.	52%	n.a.	n.a.	62%
	A lot of the process	n.a.	n.a.	21%	n.a.	n.a.	23%	n.a.	n.a.	19%
	Some of the process	n.a.	n.a.	17%	n.a.	n.a.	20%	n.a.	n.a.	15%
	None of the process	n.a.	n.a.	2%	n.a.	n.a.	3%	n.a.	n.a.	2%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	2%
	N	n.a.	n.a.	2,447	n.a.	n.a.	1,113	n.a.	n.a.	1,334
F8e	...Provide on-site behavioral health care that is integrated into primary care services									
	Most or all of the process	n.a.	n.a.	48%	n.a.	n.a.	39%	n.a.	n.a.	55%
	A lot of the process	n.a.	n.a.	15%	n.a.	n.a.	18%	n.a.	n.a.	12%
	Some of the process	n.a.	n.a.	17%	n.a.	n.a.	19%	n.a.	n.a.	16%
	None of the process	n.a.	n.a.	3%	n.a.	n.a.	5%	n.a.	n.a.	2%
	Not currently doing this process at all	n.a.	n.a.	9%	n.a.	n.a.	12%	n.a.	n.a.	6%
	Don't know	n.a.	n.a.	8%	n.a.	n.a.	8%	n.a.	n.a.	8%
	N	n.a.	n.a.	2,445	n.a.	n.a.	1,112	n.a.	n.a.	1,333

Table 3.B.7a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8f	...Assess patients' health-related social service needs and refer them to community resources									
	Most or all of the process	n.a.	n.a.	58%	n.a.	n.a.	51%	n.a.	n.a.	64%
	A lot of the process	n.a.	n.a.	22%	n.a.	n.a.	24%	n.a.	n.a.	20%
	Some of the process	n.a.	n.a.	16%	n.a.	n.a.	19%	n.a.	n.a.	13%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	1%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	2%
	N	n.a.	n.a.	2,441	n.a.	n.a.	1,110	n.a.	n.a.	1,331
F8g	...Coordinate care with specialists									
	Most or all of the process	n.a.	n.a.	69%	n.a.	n.a.	65%	n.a.	n.a.	73%
	A lot of the process	n.a.	n.a.	21%	n.a.	n.a.	23%	n.a.	n.a.	18%
	Some of the process	n.a.	n.a.	9%	n.a.	n.a.	11%	n.a.	n.a.	6%
	None of the process	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	0%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	2%
	N	n.a.	n.a.	2,444	n.a.	n.a.	1,113	n.a.	n.a.	1,331
F8h	...Use formal written agreements with specialists to set expectations about roles and information sharing									
	Most or all of the process	n.a.	n.a.	36%	n.a.	n.a.	31%	n.a.	n.a.	39%
	A lot of the process	n.a.	n.a.	20%	n.a.	n.a.	20%	n.a.	n.a.	20%
	Some of the process	n.a.	n.a.	24%	n.a.	n.a.	29%	n.a.	n.a.	20%
	None of the process	n.a.	n.a.	9%	n.a.	n.a.	10%	n.a.	n.a.	9%
	Not currently doing this process at all	n.a.	n.a.	4%	n.a.	n.a.	5%	n.a.	n.a.	3%
	Don't know	n.a.	n.a.	7%	n.a.	n.a.	5%	n.a.	n.a.	8%
	N	n.a.	n.a.	2,443	n.a.	n.a.	1,110	n.a.	n.a.	1,333
F8i	...Ensure a range of options for how and when patients can access primary care from practice (for example, phone visits or extended office hours)									
	Most or all of the process	n.a.	n.a.	74%	n.a.	n.a.	72%	n.a.	n.a.	76%
	A lot of the process	n.a.	n.a.	18%	n.a.	n.a.	20%	n.a.	n.a.	16%
	Some of the process	n.a.	n.a.	7%	n.a.	n.a.	6%	n.a.	n.a.	7%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	1%
	N	n.a.	n.a.	2,443	n.a.	n.a.	1,112	n.a.	n.a.	1,331

Table 3.B.7a *(continued)*

Question[a]		Combined tracks			Track 1 overall			Track 2 overall		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8j	...Track and use quality measures and other data to guide practice improvements									
	Most or all of the process	n.a.	n.a.	74%	n.a.	n.a.	71%	n.a.	n.a.	77%
	A lot of the process	n.a.	n.a.	17%	n.a.	n.a.	20%	n.a.	n.a.	16%
	Some of the process	n.a.	n.a.	7%	n.a.	n.a.	7%	n.a.	n.a.	6%
	None of the process	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%
	N	n.a.	n.a.	2,442	n.a.	n.a.	1,111	n.a.	n.a.	1,331
F8k	...Use Patient and Family Advisory Councils (PFACs) to better understand what matters most to patients and to guide improvements at practice									
	Most or all of the process	n.a.	n.a.	30%	n.a.	n.a.	29%	n.a.	n.a.	30%
	A lot of the process	n.a.	n.a.	24%	n.a.	n.a.	21%	n.a.	n.a.	26%
	Some of the process	n.a.	n.a.	28%	n.a.	n.a.	30%	n.a.	n.a.	26%
	None of the process	n.a.	n.a.	11%	n.a.	n.a.	13%	n.a.	n.a.	10%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%
	Don't know	n.a.	n.a.	6%	n.a.	n.a.	7%	n.a.	n.a.	6%
	N	n.a.	n.a.	2,444	n.a.	n.a.	1,113	n.a.	n.a.	1,331

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; PY = Program Year

Table 3.B.7b. CPC+ practices' experience with CPC+, overall by track and SSP status (2017 Starters)

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Overall perception of CPC+													
F3	Given practice's overall experience in CPC+, likelihood practice would participate in CPC+ if practice could do it all over again												
	Very likely	66%	62%	63%	59%	58%	55%	69%	80%	75%	68%	67%	71%
	Somewhat likely	26%	32%	30%	31%	32%	37%	28%	15%	24%	26%	27%	22%
	Not very likely	6%	4%	5%	7%	7%	5%	2%	4%	1%	5%	5%	5%
	Not at all likely	2%	1%	2%	3%	3%	2%	1%	1%	0%	2%	2%	2%
	N	592	593	593	535	531	534	615	616	616	718	717	720
F4	The extent to which participation in CPC+ improved the quality of care that the practice provides to its patients												
	A lot	46%	55%	57%	38%	47%	48%	48%	60%	58%	47%	54%	57%
	Somewhat	47%	38%	39%	49%	46%	49%	48%	39%	40%	48%	41%	39%
	Not very much	5%	6%	3%	12%	6%	3%	3%	1%	1%	5%	3%	3%
	Not at all	1%	<1%	1%	1%	<1%	1%	<1%	0%	0%	1%	1%	<1%
	N	592	594	593	534	533	534	614	612	615	723	718	720
Staff involvement in implementing CPC+													
F1a	Medical director or clinician lead at the practice site												
	Very involved	55%	56%	55%	59%	62%	62%	67%	66%	63%	68%	71%	68%
	Somewhat involved	35%	34%	36%	31%	31%	31%	28%	31%	34%	25%	23%	24%
	Not very involved	8%	5%	5%	7%	6%	6%	3%	2%	3%	5%	4%	6%
	Not at all involved	2%	5%	4%	3%	2%	1%	1%	1%	<1%	2%	2%	2%
	N	587	590	592	530	525	527	612	611	614	718	710	716
F1b	Physicians												
	Very involved	35%	42%	45%	42%	45%	46%	36%	34%	39%	53%	55%	54%
	Somewhat involved	53%	49%	43%	46%	46%	45%	57%	61%	50%	37%	38%	37%
	Not very involved	11%	6%	10%	10%	8%	8%	6%	4%	11%	8%	7%	7%
	Not at all involved	1%	2%	2%	2%	1%	2%	1%	1%	<1%	1%	<1%	2%
	N	590	593	588	535	529	532	611	615	609	720	710	718

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F1c	Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)												
	Very involved	16%	19%	24%	23%	26%	27%	23%	20%	28%	36%	38%	40%
	Somewhat involved	34%	38%	28%	35%	32%	33%	33%	46%	35%	29%	29%	30%
	Not very involved	8%	5%	9%	9%	7%	8%	8%	5%	9%	6%	7%	6%
	Not at all involved	2%	2%	2%	2%	2%	1%	1%	1%	<1%	3%	1%	2%
	No NPs/PAs/CNSs	40%	37%	37%	31%	32%	31%	34%	27%	27%	27%	25%	22%
	N	592	594	592	532	533	535	613	615	613	722	720	722
F1d	Clinical support staff												
	Very involved	39%	47%	55%	44%	54%	52%	49%	52%	55%	58%	61%	61%
	Somewhat involved	53%	47%	35%	49%	40%	38%	47%	40%	38%	37%	35%	34%
	Not very involved	7%	5%	8%	5%	6%	9%	4%	9%	7%	4%	3%	4%
	Not at all involved	<1%	2%	3%	1%	1%	1%	1%	<1%	0%	2%	<1%	1%
	N	593	593	592	535	529	533	614	615	614	722	717	721
F1e	Clerical support staff												
	Very involved	30%	31%	33%	33%	39%	33%	43%	35%	44%	41%	42%	42%
	Somewhat involved	51%	52%	42%	52%	43%	44%	41%	47%	39%	43%	46%	44%
	Not very involved	15%	14%	19%	13%	17%	21%	12%	18%	11%	13%	11%	11%
	Not at all involved	3%	3%	5%	2%	2%	2%	3%	1%	5%	3%	1%	3%
	N	592	594	591	534	530	532	613	616	614	721	716	721
F2	System-level leadership (e.g., chief executive officer or chief medical officer)												
	Very involved	46%	39%	40%	37%	40%	41%	71%	62%	70%	52%	49%	47%
	Somewhat involved	22%	32%	29%	25%	23%	19%	14%	23%	16%	22%	23%	23%
	Not very involved	10%	11%	11%	7%	7%	10%	5%	4%	3%	5%	5%	7%
	Not at all involved	4%	<1%	3%	5%	1%	3%	1%	<1%	1%	1%	2%	2%
	Practice site is independent and not part of a system	17%	18%	16%	27%	28%	27%	10%	11%	10%	20%	22%	20%
	N	593	592	593	532	528	534	614	610	616	724	719	722
Extent to which CPC+ requirements are burdensome													
F5a	Meeting care delivery requirements												
	Not at all burdensome	4%	5%	6%	3%	6%	6%	5%	7%	10%	5%	6%	9%
	Not very burdensome	31%	24%	24%	31%	31%	32%	24%	29%	37%	27%	31%	31%
	Somewhat burdensome	45%	60%	57%	47%	45%	50%	49%	48%	35%	56%	51%	52%
	Very burdensome	18%	10%	13%	17%	16%	11%	21%	15%	17%	11%	11%	6%
	Don't know	2%	1%	1%	1%	2%	1%	1%	1%	1%	2%	1%	2%
	N	592	592	591	533	533	534	616	614	616	723	724	721

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F5b	Completing care delivery reporting requirements												
	Not at all burdensome	2%	3%	4%	2%	4%	6%	5%	6%	4%	5%	4%	6%
	Not very burdensome	20%	28%	23%	19%	23%	28%	22%	26%	26%	19%	28%	29%
	Somewhat burdensome	48%	46%	47%	52%	52%	47%	43%	48%	44%	53%	52%	45%
	Very burdensome	28%	22%	26%	26%	19%	16%	28%	18%	25%	22%	14%	16%
	Don't know	2%	1%	<1%	1%	2%	2%	2%	1%	1%	2%	2%	4%
	N	592	593	592	534	532	534	616	616	614	723	724	721
F5c	Completing financial reporting requirements												
	Not at all burdensome	2%	2%	2%	1%	3%	3%	2%	2%	4%	2%	3%	3%
	Not very burdensome	14%	13%	13%	12%	20%	17%	14%	12%	16%	12%	18%	19%
	Somewhat burdensome	20%	36%	32%	30%	34%	47%	25%	30%	31%	32%	34%	36%
	Very burdensome	48%	41%	47%	48%	35%	26%	53%	53%	45%	43%	36%	31%
	Don't know	16%	8%	6%	9%	9%	7%	7%	4%	4%	11%	9%	10%
	N	591	593	592	532	532	534	615	616	613	723	723	721
F5d	Meeting health IT requirements												
	Not at all burdensome	7%	11%	12%	8%	13%	18%	7%	11%	19%	8%	14%	16%
	Not very burdensome	29%	36%	28%	35%	36%	37%	25%	35%	38%	30%	34%	34%
	Somewhat burdensome	34%	38%	49%	28%	30%	29%	38%	37%	32%	32%	31%	27%
	Very burdensome	18%	9%	8%	21%	12%	10%	24%	13%	9%	20%	12%	13%
	Don't know	13%	7%	3%	9%	9%	5%	7%	3%	3%	11%	9%	10%
	N	592	593	592	533	531	534	616	616	616	721	723	721
CPC+ and coronavirus pandemic													
F7	Practice was better positioned to meet patients' care needs during the coronavirus pandemic because of practice's participation in CPC+												
	Strongly agree	n.a.	n.a.	8%	n.a.	n.a.	6%	n.a.	n.a.	17%	n.a.	n.a.	23%
	Agree	n.a.	n.a.	28%	n.a.	n.a.	31%	n.a.	n.a.	28%	n.a.	n.a.	29%
	Neither agree nor disagree	n.a.	n.a.	53%	n.a.	n.a.	48%	n.a.	n.a.	50%	n.a.	n.a.	38%
	Disagree	n.a.	n.a.	7%	n.a.	n.a.	11%	n.a.	n.a.	3%	n.a.	n.a.	7%
	Strongly disagree	n.a.	n.a.	4%	n.a.	n.a.	5%	n.a.	n.a.	3%	n.a.	n.a.	3%
	N	n.a.	n.a.	593	n.a.	n.a.	534	n.a.	n.a.	616	n.a.	n.a.	721

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
Sustainability of CPC+													
Among practices still participating in CPC+, how much of the practice's current process the practice is likely to maintain after CPC+ ends…													
F8a	...Risk stratify patients												
	Most or all of the process	n.a.	n.a.	63%	n.a.	n.a.	59%	n.a.	n.a.	71%	n.a.	n.a.	68%
	A lot of the process	n.a.	n.a.	17%	n.a.	n.a.	19%	n.a.	n.a.	18%	n.a.	n.a.	15%
	Some of the process	n.a.	n.a.	15%	n.a.	n.a.	15%	n.a.	n.a.	10%	n.a.	n.a.	11%
	None of the process	n.a.	n.a.	2%	n.a.	n.a.	3%	n.a.	n.a.	<1%	n.a.	n.a.	2%
	Not currently doing this process at all	n.a.	n.a.	0%	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	3%	n.a.	n.a.	1%	n.a.	n.a.	3%
	N	n.a.	n.a.	579	n.a.	n.a.	522	n.a.	n.a.	614	n.a.	n.a.	713
F8b	...Provide short-term ("episodic") care management for patients who had a recent hospital admission or ED visit												
	Most or all of the process	n.a.	n.a.	70%	n.a.	n.a.	69%	n.a.	n.a.	74%	n.a.	n.a.	73%
	A lot of the process	n.a.	n.a.	22%	n.a.	n.a.	23%	n.a.	n.a.	20%	n.a.	n.a.	17%
	Some of the process	n.a.	n.a.	6%	n.a.	n.a.	7%	n.a.	n.a.	4%	n.a.	n.a.	5%
	None of the process	n.a.	n.a.	0%	n.a.	n.a.	0%	n.a.	n.a.	0%	n.a.	n.a.	1%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	4%
	N	n.a.	n.a.	579	n.a.	n.a.	523	n.a.	n.a.	615	n.a.	n.a.	713
F8c	...Work with a care manager to provide proactive, long-term, relationship-based ("longitudinal") care management												
	Most or all of the process	n.a.	n.a.	67%	n.a.	n.a.	63%	n.a.	n.a.	68%	n.a.	n.a.	63%
	A lot of the process	n.a.	n.a.	15%	n.a.	n.a.	24%	n.a.	n.a.	17%	n.a.	n.a.	23%
	Some of the process	n.a.	n.a.	15%	n.a.	n.a.	9%	n.a.	n.a.	10%	n.a.	n.a.	9%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	4%	n.a.	n.a.	4%
	N	n.a.	n.a.	584	n.a.	n.a.	529	n.a.	n.a.	614	n.a.	n.a.	716

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8d	...Use care plans for high-risk patients that reflect patient preferences, goals, and wishes												
	Most or all of the process	n.a.	n.a.	54%	n.a.	n.a.	49%	n.a.	n.a.	72%	n.a.	n.a.	54%
	A lot of the process	n.a.	n.a.	22%	n.a.	n.a.	24%	n.a.	n.a.	15%	n.a.	n.a.	22%
	Some of the process	n.a.	n.a.	20%	n.a.	n.a.	20%	n.a.	n.a.	12%	n.a.	n.a.	18%
	None of the process	n.a.	n.a.	2%	n.a.	n.a.	4%	n.a.	n.a.	1%	n.a.	n.a.	2%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	4%
	N	n.a.	n.a.	584	n.a.	n.a.	529	n.a.	n.a.	616	n.a.	n.a.	718
F8e	...Provide on-site behavioral health care that is integrated into primary care services												
	Most or all of the process	n.a.	n.a.	43%	n.a.	n.a.	34%	n.a.	n.a.	63%	n.a.	n.a.	48%
	A lot of the process	n.a.	n.a.	19%	n.a.	n.a.	17%	n.a.	n.a.	12%	n.a.	n.a.	13%
	Some of the process	n.a.	n.a.	17%	n.a.	n.a.	20%	n.a.	n.a.	11%	n.a.	n.a.	21%
	None of the process	n.a.	n.a.	5%	n.a.	n.a.	5%	n.a.	n.a.	1%	n.a.	n.a.	3%
	Not currently doing this process at all	n.a.	n.a.	12%	n.a.	n.a.	13%	n.a.	n.a.	4%	n.a.	n.a.	9%
	Don't know	n.a.	n.a.	5%	n.a.	n.a.	11%	n.a.	n.a.	9%	n.a.	n.a.	7%
	N	n.a.	n.a.	584	n.a.	n.a.	528	n.a.	n.a.	616	n.a.	n.a.	717
F8f	...Assess patients' health-related social service needs and refer them to community resources												
	Most or all of the process	n.a.	n.a.	49%	n.a.	n.a.	52%	n.a.	n.a.	66%	n.a.	n.a.	63%
	A lot of the process	n.a.	n.a.	24%	n.a.	n.a.	25%	n.a.	n.a.	18%	n.a.	n.a.	22%
	Some of the process	n.a.	n.a.	20%	n.a.	n.a.	19%	n.a.	n.a.	15%	n.a.	n.a.	11%
	None of the process	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	<1%	n.a.	n.a.	1%
	Not currently doing this process at all	n.a.	n.a.	3%	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	1%
	Don't know	n.a.	n.a.	2%	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	3%
	N	n.a.	n.a.	581	n.a.	n.a.	529	n.a.	n.a.	615	n.a.	n.a.	716

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8g	...Coordinate care with specialists												
	Most or all of the process	n.a.	n.a.	63%	n.a.	n.a.	66%	n.a.	n.a.	75%	n.a.	n.a.	71%
	A lot of the process	n.a.	n.a.	22%	n.a.	n.a.	24%	n.a.	n.a.	18%	n.a.	n.a.	18%
	Some of the process	n.a.	n.a.	13%	n.a.	n.a.	9%	n.a.	n.a.	6%	n.a.	n.a.	7%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	0%	n.a.	n.a.	0%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	0%	n.a.	n.a.	3%
	N	n.a.	n.a.	584	n.a.	n.a.	529	n.a.	n.a.	615	n.a.	n.a.	716
F8h	...Use formal written agreements with specialists to set expectations about roles and information sharing												
	Most or all of the process	n.a.	n.a.	35%	n.a.	n.a.	26%	n.a.	n.a.	42%	n.a.	n.a.	38%
	A lot of the process	n.a.	n.a.	16%	n.a.	n.a.	23%	n.a.	n.a.	18%	n.a.	n.a.	23%
	Some of the process	n.a.	n.a.	31%	n.a.	n.a.	28%	n.a.	n.a.	23%	n.a.	n.a.	17%
	None of the process	n.a.	n.a.	8%	n.a.	n.a.	13%	n.a.	n.a.	6%	n.a.	n.a.	11%
	Not currently doing this process at all	n.a.	n.a.	5%	n.a.	n.a.	4%	n.a.	n.a.	3%	n.a.	n.a.	3%
	Don't know	n.a.	n.a.	4%	n.a.	n.a.	6%	n.a.	n.a.	8%	n.a.	n.a.	8%
	N	n.a.	n.a.	582	n.a.	n.a.	528	n.a.	n.a.	616	n.a.	n.a.	717
F8i	...Ensure a range of options for how and when patients can access primary care from practice (for example, phone visits or extended office hours)												
	Most or all of the process	n.a.	n.a.	71%	n.a.	n.a.	73%	n.a.	n.a.	76%	n.a.	n.a.	76%
	A lot of the process	n.a.	n.a.	20%	n.a.	n.a.	20%	n.a.	n.a.	13%	n.a.	n.a.	18%
	Some of the process	n.a.	n.a.	7%	n.a.	n.a.	6%	n.a.	n.a.	10%	n.a.	n.a.	4%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	<1%	n.a.	n.a.	0%
	Don't know	n.a.	n.a.	<1%	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	2%
	N	n.a.	n.a.	584	n.a.	n.a.	528	n.a.	n.a.	615	n.a.	n.a.	716

Table 3.B.7b *(continued)*

Question[a]		Track 1 – SSP			Track 1 – Not SSP			Track 2 – SSP			Track 2 – Not SSP		
		PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)	PY 2 (2018)	PY 3 (2019)	PY 4 (2020)
F8j	...Track and use quality measures and other data to guide practice improvements												
	Most or all of the process	n.a.	n.a.	72%	n.a.	n.a.	70%	n.a.	n.a.	82%	n.a.	n.a.	73%
	A lot of the process	n.a.	n.a.	20%	n.a.	n.a.	20%	n.a.	n.a.	12%	n.a.	n.a.	19%
	Some of the process	n.a.	n.a.	7%	n.a.	n.a.	8%	n.a.	n.a.	5%	n.a.	n.a.	6%
	None of the process	n.a.	n.a.	1%	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	<1%
	Not currently doing this process at all	n.a.	n.a.	<1%	n.a.	n.a.	0%	n.a.	n.a.	0%	n.a.	n.a.	<1%
	Don't know	n.a.	n.a.	1%	n.a.	n.a.	2%	n.a.	n.a.	1%	n.a.	n.a.	2%
	N	n.a.	n.a.	583	n.a.	n.a.	528	n.a.	n.a.	614	n.a.	n.a.	717
F8k	...Use Patient and Family Advisory Councils (PFACs) to better understand what matters most to patients and to guide improvements at practice												
	Most or all of the process	n.a.	n.a.	29%	n.a.	n.a.	28%	n.a.	n.a.	33%	n.a.	n.a.	28%
	A lot of the process	n.a.	n.a.	21%	n.a.	n.a.	21%	n.a.	n.a.	26%	n.a.	n.a.	27%
	Some of the process	n.a.	n.a.	33%	n.a.	n.a.	26%	n.a.	n.a.	24%	n.a.	n.a.	28%
	None of the process	n.a.	n.a.	13%	n.a.	n.a.	14%	n.a.	n.a.	8%	n.a.	n.a.	11%
	Not currently doing this process at all	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%	n.a.	n.a.	1%
	Don't know	n.a.	n.a.	4%	n.a.	n.a.	9%	n.a.	n.a.	7%	n.a.	n.a.	5%
	N	n.a.	n.a.	584	n.a.	n.a.	529	n.a.	n.a.	614	n.a.	n.a.	717

Source: CPC+ Practice Survey administered to the 2017 Starter CPC+ practices June through September 2018 (PY 2), July through November 2019 (PY 3), and September through December 2020 (PY 4). There are differences between the surveys by PY that could change how practices respond to questions; these differences are indicated with footnotes.

Notes: The data presented in this table represent responses from the practices that began CPC+ in 2017 (2017 Starters) and had completed all four waves of surveys, regardless of whether they were still participating in CPC+ at the time of their response.

[a] Survey questions in this table were not asked in the PY 1 survey. The question numbering is based on the PY 4 survey.

n.a. = not applicable because the survey question was not asked in that wave or to the specified group of practices, or there were no eligible practices to receive the question; PY = Program Year; SSP = Medicare Shared Savings Program (reflects 2020 [PY 4] participation, or, for practices that withdrew from CPC+, their participation at the time of withdrawal).

Table 3.B.8. Differences in the wording of questions and response categories between survey waves (differences in red text)

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
A1	This question is about all practitioners at this practice site, regardless of specialty. How many total practitioners work full-time (35 hours or more per week) and part time (fewer than 35 hours per week) at this practice site? Please include all practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such practitioners at this practice site. Response categories: Total Practitioners a. Physician (MD or DO), not including psychiatrist b. Physician resident or fellow (trainee) c. Nurse practitioner (NP) d. Physician assistant (PA) e. Clinical Nurse Specialist (CNS)	This question is about all practitioners at this practice site, regardless of specialty **[CPC+ PRACTICES ONLY: or whether they are involved in CPC+].** How many total practitioners work full-time (35 hours or more per week) and part time (fewer than 35 hours per week) at this practice site? Please include all practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such practitioners at this practice site. Response categories: Total Practitioners a. Physician (MD or DO), not including psychiatrist b. Physician resident or fellow (trainee) c. Nurse practitioner (NP) d. Physician assistant (PA) e. Clinical **n**urse **s**pecialist (CNS)	Question stem and response categories		None		None

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
D2	*Not asked.*	The Performance-Based Incentive Payment (PBIP) is paid by CMS prospectively at the beginning of each program year. After each program year ends, CMS retrospectively reconciles the amount of PBIP that a practice earned based on how well the practice performed on patient experience of care measures, clinical quality measures, and utilization measures that drive total cost of care. Thinking about this practice's experience with the PBIP payments from Medicare FFS, please indicate how much you agree or disagree with the following statements. a. Our practice understands how Medicare FFS calculates the proportion of the Performance-Based Incentive Payment (PBIP) my practice will retain and the proportion CMS will recoup b. Our practice feels that Medicare FFS's methodology is fair in how it determines the proportion of the Performance-Based Incentive Payment (PBIP) my practice will retain and the proportion CMS will recoup	New	The Performance-Based Incentive Payment (PBIP) is paid by CMS prospectively at the beginning of each program year. After each program year ends, CMS retrospectively reconciles the amount of PBIP that a practice earned based on how well the practice performed on patient experience of care measures, clinical quality measures, and utilization measures that drive total cost of care. Thinking about this practice's experience with the PBIP payments **and recoupments** from Medicare FFS, please indicate how much you agree or disagree with the following statements. a. Our practice understands how Medicare FFS calculates the proportion of the Performance-Based Incentive Payment (PBIP) my practice **retains** and the proportion CMS **recoups** b. Our practice feels that Medicare FFS's methodology is fair in how it determines the proportion of the Performance-Based Incentive Payment (PBIP) my practice **retains** and the proportion CMS **recoups**	Question stem		None

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
D3	*Not asked.*	The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management (E&M) services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP. Thinking about this practice's experience with the 2017 CPCP payments from Medicare FFS for CPC+, please indicate how much you agree or disagree with the following statements. a. Our practice understands how Medicare FFS calculated its Comprehensive Primary Care Payments (CPCPs) b. Our practice feels that Medicare FFS' methodology is fair in how it calculates Comprehensive Primary Care Payments (CPCPs)	New		None	The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management (E&M) services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP. Thinking about this practice's experience with the 2017 CPCP payments from Medicare FFS for CPC+, please indicate how much you agree or disagree with the following statements. a. Our practice understands how Medicare FFS calculates its Comprehensive Primary Care Payments (CPCPs) b. Our practice feels that Medicare FFS' methodology is fair in how it calculates Comprehensive Primary Care Payments (CPCPs)	Question stem

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
D4	*Not asked.*	CPC+ payer partners are payers other than Medicare FFS that participate in CPC+. The next set of questions is about CPC+ payments from CPC+ payer partners. These payers include private health insurers, Medicare Advantage, Medicaid FFS, and Medicaid Managed Care. Does this practice contract with CPC+ payer partners for CPC+? Yes No	New		None	**The next set of questions is about CPC+ payments from non-CMS payers. We define these as CPC+ payers other than CMS/Medicare FFS. These payers may contract in CPC+ for your commercially insured, Medicare Advantage, Medicaid FFS, or Medicaid Managed Care patients.** **Below is a list of the non-CMS CPC+ payers in your region. Which of these does your practice contract with, even if you don't receive a separate CPC+ payment from them?** **[List of payers in practice region.]**	Question stem and response categories
D5	*Not asked.*	Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments across the CPC+ payer partners you work with on CPC+? CPC+ payments from these payers could include care management fees; full or partial capitated, global, or bundled payments; or payments that reward cost or quality performance.	New		None	**[These payers/This payer] may provide payments unique to CPC+ or payments made under their patient-centered medical home (PCMH) or value-based programs for your CPC+ patients.** **CPC+ payments from [these payers/this payer] can include care management fees; full or partial capitated, global, or bundled payments; or payments that reward cost or quality performance.** Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments **[across these payers, including the payers that /from this payer, even if they] do not provide a separate CPC+ payment**	Question stem

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
D11	*Not asked.*	Thinking across all of the CPC+ payer partners you work with on CPC+, please indicate how much you agree or disagree with the following statements about this practice's experience with CPC+ payments from these CPC+ payer partners. a. Our practice understands which payments we receive from CPC+ payer partners for CPC+ b. Our practice understands how CPC+ payer partners calculated their CPC+ payments c. Our practice feels that the CPC+ payer partners' methodology to calculate CPC+ payments is fair	New		None	**Thinking of these payers that have provided your practice with their CPC+ performance payment methodology,** please indicate how much you agree or disagree with the following statements about this practice's experience with CPC+ payments **for performance from these payers: [payers marked in D10]** a. Our practice **has detailed information** from **these** payers **on how they calculate the CPC+ payments for performance** b. Our practice understands how **these** payers calculate **the** CPC+ payments **for performance** c. Our practice feels that **these** payers' methodologi**es are fair in how they determine CPC+ payments for performance**	Question stem

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
E2	*Not asked.*	The CPC+ National Learning Community and Regional Learning Network offer assistance to practices in a variety of ways. For each of the following types of assistance that this practice site may have received in the past six months, please rate how useful this assistance has been to this practice site in improving primary care. a. Webinars (for example, Action Groups or Practices in Action meetings) b. Health IT Affinity Groups (groups enabling CPC+ practices to network with their health IT vendors or other practices that use the same health IT) c. In-person learning sessions d. In-person coaching at this practice site to improve practice processes and workflows e. One-on-one telephone/virtual coaching with this practice site to improve practice processes and workflows f. CPC+ Connect (the online information resource and collaboration website for CPC+) g. CPC+ Implementation Guides h. CPC+ Practice Spotlights (articles highlighting the work of individual CPC+ practices) i. CPC+ Support (CPC+ help desk managed by Telligen)	New	The CPC+ National Learning Community and Regional Learning Network offer assistance to practices in a variety of ways. For each of the following types of assistance that this practice site may have received in the past six months, please rate how useful this assistance has been to this practice site in improving primary care. a. Webinars (for example, Action Groups, Practices in Action meetings, **or national webinars**) b. Health IT Affinity Groups (groups enabling CPC+ practices to network with their health IT vendors or other practices that use the same health IT) c. In-person learning sessions d. **In-person coaching at this practice site** e. One-on-one telephone/virtual coaching with this practice site to improve practice processes and workflows f. CPC+ Connect (the online information resource and collaboration website for CPC+) g. CPC+ Implementation Guides h. CPC+ Practice Spotlights (articles highlighting the work of individual CPC+ practices) i. CPC+ Support (CPC+ help desk managed by Telligen) **j. Regional Implementation Networking Groups (also called RINGs; attended by care managers and practice managers)**	Question stem	The CPC+ National Learning Community and Regional Learning Network offer assistance to practices in a variety of ways. For each of the following types of assistance that this practice site may have received in the past six months, please rate how useful this assistance has been to this practice site in improving primary care. a. **National webinars** **b.** One-on-one telephone/virtual coaching with this practice site to improve practice processes and workflows **c.** CPC+ Connect (the online information resource and collaboration website for CPC+) **d.** CPC+ Implementation Guides **e.** CPC+ Support (CPC+ help desk managed by Telligen) **f. Group coaching (coaching with a small number of practices, directed by a practice facilitator)**	Question stem
F1	Thinking of the different types of staff at this practice site, how involved is each staff type in implementing CPC+? a. Clinical leadership b. Physicians c. Clinical support staff d. Administrative support staff	Thinking of the different types of staff at this practice site, how involved is each type of staff in implementing CPC+? **a. Medical director or clinician lead at this practice site** b. Physicians **c. Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)** d. Clinical support staff **e. Clerical support staff**	Question stem		None		None

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
G1	During the 2016 calendar year, did any portion of this practice site's revenue come from the following sources? **a. Fee-for-service payments (payments for specific services billed to insurers)** b. Care management fees (per-patient per-month payments to support care management for patients) c. Capitation (per-patient per-month payment for specific patients, intended to cover costs of all services provided regardless of amount or type). Do not include the care management fees described in b above d. Episode-based payments (a fixed payment for all services needed for a patient with a particular condition, such as a hip fracture) *(continued below)*	**During the 2017 calendar year, what percentage of this practice site's revenue came from fee-for-service (FFS) payments? Please include FFS payments from all insurers.** **Your best estimate is fine.** **[Open percentage]** During the 2017 calendar year, did any portion of this practice site's revenue come from the following sources? a. Care management fees **(prospective payments to support care management for patients, paid in addition to usual payments for services)** b. Capitation (per-patient per-month payment for specific patients, intended to cover costs of **some or** all services provided, regardless of amount or type, **in lieu of fee-for-service payments).** Do not include the care management fees described in **item a. above. [T2 CPC+ PRACTICES ONLY: Please include the CPC+ Comprehensive Primary Care Payment (CPCP) here.]** c. Episode-based payments (a fixed payment for all services needed for a patient with a particular condition, such as an upper respiratory infection or urinary tract infection) **d. Shared savings, in which costs of care are compared to an expenditure target or to costs for another group of practices and a proportion of any savings are shared with practices.** *(continued below)*	Question stem and response categories	During the 2018 calendar year, what percentage of this practice site's revenue came from fee-for-service (FFS) payments? Please include FFS payments from all insurers. Your best estimate is fine. During the 2018 calendar year, did any portion of this practice site's revenue come from the following sources? a. Care management fees (prospective payments to support care management for patients, paid in addition to usual payments for services) b. Capitation (per-patient per-month payment for specific patients, intended to cover costs of some or all services provided, regardless of amount or type, in lieu of fee-for-service payments). Do not include the care management fees described in item a. above. **[TRACK 2** CPC+ PRACTICES, **OR FORMERLY TRACK 2 TWD PRACTICES, THAT JOINED CPC+ IN 2017** ONLY: Please include the CPC+ Comprehensive Primary Care Payment (CPCP) here.] c. Episode-based payments (a fixed payment for all services needed for a patient with a particular condition, such as an upper respiratory infection or urinary tract infection) d. Shared savings, in which costs of care are compared to an expenditure target or to costs for another group of practices and a proportion of any savings are shared with practices. *(continued below)*	Question stem	During the 2019 calendar year, what percentage of this practice site's revenue came from fee-for-service (FFS) payments? Please include FFS payments from all insurers. Your best estimate is fine.	Question stem

Table 3.B.8 *(continued)*

PY 4 question number	PY 1 question stem and response categories	PY 2 question stem and response categories, if changed	PY 2 changes	PY 3 question stem and response categories, if changed	PY 3 changes	PY 4 question stem and response categories, if changed	PY 4 changes
G1 *(continued)*	e. Financial rewards or bonuses from insurers for improving quality of care, patient experience, and/or controlling costs f. Other payments (please describe) Yes, No, Don't know	e. Financial rewards or bonuses from insurers for improving quality of care, patient experience, and/or controlling costs, not including shared savings. **[T NON-SSP CPC+ PRACTICES ONLY: Please include the CPC+ Performance-Based Incentive Payment (PBIP) here.]** f. Other payments (please describe) Yes, No, Don't know	Question stem and response categories	e. Financial rewards or bonuses from insurers for improving quality of care, patient experience, and/or controlling costs, not including shared savings. [NON-SSP **(FOR 2018)** CPC+ PRACTICES **THAT JOINED CPC+ IN 2017** ONLY: Please include **CMS's** CPC+ Performance-Based Incentive Payment (PBIP) here. / **NON-SSP (FOR 2018) TWD PRACTICES THAT JOINED CPC+ IN 2017 ONLY: Please include CMS's CPC+ Performance-Based Incentive Payment (PBIP) unless your practice stopped participating in CPC+ during the 2018 calendar year.]**	Question stem	*(see above)*	Question stem
G4	Who provided input in completing this survey? 1. Practice manager 2. Lead physician 3. Other physicians 4. Nurse practitioner (NP), Clinical Nurse Specialist (CNS), or physician assistant (PA) 5. Care manager/coordinator 6. Staff from our larger health care system or medical group 7. Quality improvement staff 8. Nursing staff 9. Medical assistant staff 10. Administrative support staff (e.g., billing staff, front desk staff) 11. Patients 99. Other (specify)	**Who filled out this survey or provided input to complete this survey?** **1. Practice or office manager (e.g., Clinic manager, office coordinator, office supervisor)** **2. Lead physician** **3. Other physicians** **4. Nurse practitioner (NP), clinical nurse specialist (CNS), or physician assistant (PA)** **5. Care manager/coordinator** **6. Nursing staff, including nurse manager or supervisor** **7. Medical assistant staff** **8. Quality improvement staff** **9. Administrative support staff (e.g., billing or finance staff, front desk staff)** **10. Nonphysician owner of practice** **11. Leadership or staff from our larger health care system or medical group (e.g., CEO, CMO)** **12. Data analytics staff (e.g., EMR analyst, health IT team)** **13. CPC+ lead** **14. Patients** **99. Other (specify)**	Question stem and response categories		None		None

[a] **Red, bolded text** indicates differences.

3.B.6. Practice Survey Instrument

This page has been left blank for double-sided copying.

Comprehensive Primary Care Plus (CPC+)

2020 Survey of Primary Care Practices

FINAL – August 5, 2020

Sponsored by
The Centers for Medicare & Medicaid Services (CMS)

Citation: Mathematica. "Evaluation of the Comprehensive Primary Care Plus (CPC+) Model: 2020 Survey of Primary Care Practices." Princeton, NJ: Mathematica, administered starting September 2020.

[INSTRUCTIONS FOR TREATMENT PRACTICES]

The 2020 Comprehensive Primary Care Plus (CPC+) Practice Survey is a critical component of the independent study sponsored by the Centers for Medicare & Medicaid Services (CMS), and its completion is a condition of your participation in CPC+. This survey is being conducted by Mathematica, an independent research company hired by CMS to conduct the study of CPC+.

The practice manager (or the person most knowledgeable about the practice) should complete the survey. **We strongly encourage you to get input from others in your practice;** for example, you may ask others to review answers to questions and discuss the survey at a practice meeting. The survey will be most helpful to you—and most accurate—if it represents a consensus view of your practice site's clinical and support staff, arriving at the best answers after discussion.

Please complete all questions in the survey to the best of your knowledge and that of others in the practice from whom you seek input.

- For practices that have more than one physical location/practice site that participates in CPC+, we will contact each site to complete the survey.
- If this practice has multiple locations/practice sites, please respond only about the site identified at the top of the screen and be as accurate as possible.

We encourage your candid responses and remind you that there is no "passing grade" for this survey. This survey was developed to understand how practices provide patient care. While this survey covers some of the general topics that you've reported on to CMS in the CPC+ Practice Portal, this survey asks about more nuanced aspects of these topics.

Your responses to this survey will never be tied to your name or your practice in any report to CMS, other payers, or the public. Your responses will only be reported to CMS in aggregate (with all CPC+ practices combined). Your responses will **not** have any consequences for payment or for your participation in CPC+. We are genuinely interested in your observations of how your practice operates today.

For the purposes of providing learning support, both nationally and in your region, your practice's name and answers **will be shared with the CPC+ learning team who will not share this information with CMS or other payers.** This information will also be shared with independent researchers to study the effects of CPC+.

Questions? Contact Mathematica by email at CPCPlusPracticeSurvey@mathematica-mpr.com or by telephone (toll-free) at 1-844-684-9433.

[INSTRUCTIONS FOR TREATMENT WITHDRAWN PRACTICES]

The 2020 Comprehensive Primary Care Plus (CPC+) Practice Survey is an important part of the study of the CPC+ initiative, sponsored by the Centers for Medicare & Medicaid Services (CMS), which seeks to improve the quality of primary care (https://innovation.cms.gov/initiatives/comprehensive-primary-care-plus). This survey is being conducted by Mathematica, an independent research company hired by CMS to conduct the study of CPC+.

Even though your practice is no longer participating in CPC+, we must collect information from practices that are participating in CPC+ and practices that are not to study the impact of how CPC+ is changing how primary care practices deliver care. We are asking you to complete the survey to help us understand how primary care practices deliver care. It is vital to the study that we understand the range of current approaches to the delivery of primary care and organizational characteristics across primary care practices.

You will receive $200 for completing this survey.

The practice manager (or the person most knowledgeable about the practice) should complete the survey. **We strongly encourage you to get input from others in your practice**; for example, you may ask others to review answers to questions and discuss the survey at a practice meeting. The survey will be most accurate if it represents a consensus view of your practice site's clinical and support staff, arriving at the best answers after discussion.

Please complete all questions in the survey to the best of your knowledge and that of others in the practice from whom you seek input. If this practice has multiple locations/practice sites, please respond only about the site identified at the top of the screen and be as accurate as possible.

We encourage your candid responses and remind you that there is no "passing grade" for this survey. This survey was developed to understand how practices provide patient care.

Your responses to this survey will never be tied to your name or your practice in any report to CMS, other payers, or the public. Your responses will only be reported to CMS in aggregate (with all practices combined). Your responses will **not** have any consequences for Medicare payments. We are genuinely interested in your observations of how your practice operates today.

If you have difficulty or questions when completing this survey, please contact Mathematica by email at CPCPlusPracticeSurvey@mathematica-mpr.com or by telephone (toll-free) at 1-844-684-9433.

IMPORTANT

- If this practice has multiple physical locations/practice sites, **please respond *only* about the site identified at the top of the screen,** and be as accurate as possible.

- The survey has been optimized to run on a desktop computer, and is best viewed in the latest versions of Chrome, Safari, Firefox, or Internet Explorer (IE 11 or Edge).

INSTRUCTIONS TO COMPLETE THE SURVEY

- To preview the survey: Click Here.

- Answer all questions to the best of your ability.

- If you answer "Other" for a question, please specify by typing what you mean in the "Specify" box.

- Click on "Back" at the bottom of the screen to go back to a previous question.

- Use the "Save and Next" button to proceed to the next question. Your answers are saved each time you click the "Save and Next" button.

- You do not have to complete the survey all at once. Be sure to click the "Save and Next" button to save your answers before exiting the survey. You will resume at the next unanswered question when you return to the survey.

- After about 20 minutes of idle time, the survey may time out, but your answers will be saved. If that happens, you will be redirected to the login page prior to resuming the survey where you left off.

- If you have any questions while taking the survey, please click on "FAQ" at the bottom of the screen at any time. If the FAQ document does not answer your question, you may email the CPC+ Practice Survey Help Desk by clicking on "Contact us" at the bottom of the screen.

- Once you have completed the survey, you will have the opportunity to review and/or print your answers before submitting the survey.

- Instructions to submit the survey when you have finished answering all the questions and reviewing your responses are listed after the survey review screen.

A. INFORMATION ABOUT THIS PRACTICE SITE

These questions focus on background information about this practice site.

PRACTITIONERS AT THIS PRACTICE SITE

A1. This question is about <u>all practitioners</u> at this practice site, regardless of specialty [CPC+ PRACTICES ONLY: or whether they are involved in CPC+]. How many <u>total practitioners</u> work <u>*full-time*</u> (<u>35 hours or more per week</u>) and <u>*part-time*</u> (<u>fewer than 35 hours per week</u>) at this practice site?

Please include all practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such practitioners at this practice site.

Total Practitioners	NUMBER <u>FULL-TIME</u> AT PRACTICE SITE	NUMBER <u>PART-TIME</u> AT PRACTICE SITE
a. Physician (MD or DO), not including psychiatrist	|___|___|___|	|___|___|___|
b. Physician resident or fellow (trainee)	|___|___|___|	|___|___|___|
c. Nurse practitioner (NP)	|___|___|___|	|___|___|___|
d. Physician assistant (PA)	|___|___|___|	|___|___|___|
e. Clinical nurse specialist (CNS)	|___|___|___|	|___|___|___|

A2. **This question focuses on the primary care practitioners at this practice site. A primary care practitioner is defined as a physician (MD or DO), nurse practitioner (NP), physician assistant (PA), or clinical nurse specialist (CNS) who has a primary specialty designation of family medicine, internal medicine, or geriatric medicine, and who practices under their own National Provider ID (NPI).**

How many primary care practitioners work *full-time* (35 hours or more per week) and *part-time* (fewer than 35 hours per week) at this practice site?

Please include all primary care practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such primary care practitioners at this practice site.

Primary Care Practitioners with Own NPI	NUMBER FULL-TIME AT PRACTICE SITE	NUMBER PART-TIME AT PRACTICE SITE
a. Physician (MD or DO)	|___|___|___|	|___|___|___|
b. Physician resident or fellow (trainee)	|___|___|___|	|___|___|___|
c. Nurse practitioner (NP)	|___|___|___|	|___|___|___|
d. Physician assistant (PA)	|___|___|___|	|___|___|___|
e. Clinical nurse specialist (CNS)	|___|___|___|	|___|___|___|

PRACTICE STAFF

A3. Does this practice site have individuals working full-time or part-time in any of the following job roles? Please include all staff who work at this practice site, regardless of who employs them.

MARK ONE RESPONSE PER ROW

		YES	NO
a.	Clinical psychologist, psychiatrist, or clinical social worker (behavioral health specialists)	1 ☐	0 ☐
b.	Quality improvement (QI) specialist	1 ☐	0 ☐
c.	Health educator, dietitian, or nutritionist	1 ☐	0 ☐
d.	Clinical pharmacist or doctor of pharmacy	1 ☐	0 ☐

PRACTICE ORGANIZATION

A4. Is your practice part of a larger health care system that includes a hospital?

1 ☐ Yes

0 ☐ No

B. CARE MANAGEMENT

B1. **This question is about <u>care managers/care coordinators who work as part of a practice's care team, regardless of who employs them or where they are located</u>.**

A care manager/care coordinator works with high-risk patients between and during visits to provide ongoing support and education on chronic care management, and coordinates care from other providers. A care team consists of staff who regularly work together to provide patient care.

How many <u>full-time</u> and <u>part-time</u> care manager(s) and/or care coordinator(s) work as part of a care team at this practice site to address the needs of its patients? Please include all staff who work at this practice site, regardless of who employs them. Please enter "0" if no care managers or care coordinators work as part of a care team at this practice site.

	NUMBER OF STAFF
a. Full-time care managers and care coordinators	|___|___|___|
b. Part-time care managers and care coordinators	|___|___|___|

B1c. **[IF B1a+B1b = 0 OR M; no care managers work as part of a care team at this practice site, or respondent left B1 blank]**

What is the main reason your practice does not have a care manager or care coordinator working as part of a care team at this practice site?

[ONLY DISPLAY OPTION 2 AND FILL IN OPTION 3 IF A4 = 1; practice is part of a larger health care system]

MARK ONE ONLY

1 ☐ Amount of CPC+ care management fees is not enough to support hiring care managers

[2 ☐ Our health care system does not provide us with care manager time]

3 ☐ Our practice [or health care system] does not think we need a care manager

4 ☐ Inadequate supply of qualified care managers available to hire

5 ☐ Insufficient space at our practice to accommodate a care manager

6 ☐ Other (Specify) _____

B2. [IF B1a>0 OR B1b>0; has care managers/care coordinators]

What is the clinical background of the care managers or care coordinators at this practice site?

MARK ALL THAT APPLY

1 ☐ Registered nurse (RN)

2 ☐ Licensed practical nurse (LPN) or licensed vocational nurse (LVN)

3 ☐ Medical assistant (MA)

4 ☐ Social worker

5 ☐ Other clinical background

6 ☐ No clinical background

B2a. [IF B1a>0 OR B1b>0; has care managers/care coordinators]

Do any care managers and/or care coordinators at this practice site have behavioral health training (such as screening for and monitoring of mental health conditions, and providing education and self-management support)?

1 ☐ Yes

0 ☐ No

B3. [If B1a>0; has at least one F/T care manager]

[Fill if B1a>1 (more than one F/T care manager)] This question is about <u>one</u> of the full-time care managers/care coordinators for this practice site. In order to randomly select which care manager/care coordinator to answer this question for, please select the one <u>whose first name comes first alphabetically</u>.]

How many patients from this practice site are currently under <u>longitudinal care management</u> for chronic conditions with [this/the] <u>full-time</u> care manager/care coordinator?

Do <u>not</u> include patients who are receiving <u>only</u> episodic care management (for example, follow-up after hospital or ED visits).

Your best estimate is fine.

Number of patients currently under longitudinal care management with full-time care manager/care coordinator: |__|__|__|

B4. [If B1a=0 or blank AND B1b>0; has only P/T care managers]

[Fill if B1b>1 (more than one P/T care manager)] The next two questions are about one of the part-time care managers/care coordinators for this practice site. In order to randomly select which care manager/care coordinator to answer these questions for, please select the one whose first name comes first alphabetically.

How many patients from this practice site are currently under longitudinal care management for chronic conditions with [this/the] part-time care manager/care coordinator?

Do not include patients who are receiving only episodic care management (for example, follow-up after hospital or ED visits).

Your best estimate is fine.

Number of patients currently under longitudinal care management with part-time care manager/care coordinator: |___|___|___|

B5. [If B1a=0 or blank AND B1b>0; has only P/T care managers]

About how many hours does [this/the] part-time care manager/care coordinator work on longitudinal care management for this practice in an average week?

Your best estimate is fine.

Number of hours part-time care manager/care coordinator works on longitudinal care management in a week: |___|___|___|

B6. [B6: only if (B1a+B1b > 0) OR if Number of care managers in W3 > 0 (i.e., practice reported in wave 3 or wave 4 survey that they had at least one care manager)]

Please indicate if any of the following are challenges that your practice faces in providing longitudinal care management for chronic conditions.

		IS THIS A CHALLENGE TO PROVIDING LONGITUDINAL CARE MANAGEMENT?		
		NO, NOT A CHALLENGE	**YES, MINOR CHALLENGE**	**YES, MAJOR CHALLENGE**
a.	Risk stratification methods used to identify patients for longitudinal care management are sometimes inaccurate or do not allow adjustment based on clinical judgment	0 ☐	1 ☐	2 ☐
b.	Processes used to assign patients to a care manager are inadequate	0 ☐	1 ☐	2 ☐
c.	Insufficient care manager staff time to provide longitudinal care management for chronic conditions	0 ☐	1 ☐	2 ☐
d.	Insufficient community-based resources to meet patient needs	0 ☐	1 ☐	2 ☐
e.	Care management staff lack sufficient skills	0 ☐	1 ☐	2 ☐
f.	Logistical obstacles to reaching patients (such as incorrect patient contact information, hard to reach)	0 ☐	1 ☐	2 ☐
g.	Lack of patient interest in interacting with a care manager	0 ☐	1 ☐	2 ☐
h.	Insufficient patient adherence to care manager's recommendations	0 ☐	1 ☐	2 ☐
i.	Insufficient practitioner buy-in of benefit of longitudinal care management services to patients	0 ☐	1 ☐	2 ☐
j.	Insufficient organizational buy-in of benefit of longitudinal care management services to patients	0 ☐	1 ☐	2 ☐
k.	Lack of or ineffective health IT functionality (HIT) to support longitudinal care management	0 ☐	1 ☐	2 ☐
l.	Other (Specify) _____	0 ☐	1 ☐	2 ☐

B7. [ONLY IF (B1a+B1b > 0) AND IF B6c = 1 OR 2 (INSUFFICIENT CARE MANAGER TIME TO PROVIDE LONGITUDINAL CARE MANAGEMENT IS A MINOR OR MAJOR CHALLENGE)]

What is the main reason your practice does not have sufficient care manager staff time for longitudinal care management?

MARK ONE ONLY

[ONLY DISPLAY OPTION 2 IF A4 = 1; practice is part of a larger health care system]

1 ☐ Amount of CPC+ care management fees is not enough to support hiring more care managers

[2 ☐ Our health care system does not provide us with as much care manager time as our patient population needs]

3 ☐ Care manager staff time is focused on episodic care management (for example, follow-up after hospital or ED visits)

4 ☐ Inadequate supply of qualified care managers available to hire

5 ☐ Other (Specify) _____

C. PRACTICE SITE REVENUES

C1. During the 2019 calendar year, what percentage of this practice site's revenue came from fee-for-service (FFS) payments? Please include FFS payments from all insurers.

Your best estimate is fine.

Percentage of 2019 practice revenue from fee-for-service |___|___|___|%

D. CPC+ PAYMENTS

The following sections are about your practice's experience with CPC+. The questions in this section are about this practice site's CPC+ payments from CMS/Medicare FFS and non-CMS payers. Please note that we will NOT share practice-identifiable responses to this section (or any of your other responses to this survey) with CMS or non-CMS payers.

[CPC+ TWD PRACTICES THAT HAVE WITHDRAWN WITHIN ONE YEAR OR LESS: We are aware that this practice site is no longer participating in CPC+. Please answer the questions in this section to the best of your ability based on this practice site's experience when it was participating in CPC+.]

CMS/MEDICARE FFS – CPC+ PAYMENTS

D1. [IF TRACK 1 AND PARTICIPATED IN AN SSP IN 2018 AND 2019 AND 2020 (ALL THREE YEARS): This question]/[ALL OTHERS: The first set of questions] is about CPC+ payments from Medicare fee-for-service (FFS).

Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments from Medicare FFS?

1 ☐ More than adequate

2 ☐ Adequate

3 ☐ Less than adequate

d ☐ Don't know – not familiar with CPC+ payments from Medicare FFS or costs of doing CPC+ work

D2. [IF DID NOT PARTICIPATE IN AN SSP IN AT LEAST ONE OF THE YEARS BETWEEN 2018 - 2020]: The Performance-Based Incentive Payment (PBIP) is paid by CMS prospectively at the beginning of each program year. After each program year ends, CMS retrospectively reconciles the amount of PBIP that a practice earned based on how well the practice performed on patient experience of care measures, clinical quality measures, and utilization measures that drive total cost of care.

Thinking about this practice's experience with the PBIP payments and recoupments from Medicare FFS, please indicate how much you agree or disagree with the following statements.

MARK ONE RESPONSE PER ROW

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. Our practice <u>understands</u> how Medicare FFS calculates the proportion of the Performance-Based Incentive Payment (PBIP) my practice retains and the proportion CMS recoups	1 ☐	2 ☐	3 ☐	4 ☐	
b. Our practice feels that Medicare FFS's methodology <u>is fair</u> in how it determines the proportion of the Performance-Based Incentive Payment (PBIP) my practice retains and the proportion CMS recoups	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

D3. [IF TRACK 2]: The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management (E&M) services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP.

Thinking about this practice's experience with the CPCP payments from Medicare FFS for CPC+, please indicate how much you agree or disagree with the following statements.

MARK ONE RESPONSE PER ROW

		STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a.	Our practice <u>understands</u> how Medicare FFS calculates its Comprehensive Primary Care Payments (CPCPs)	1 ☐	2 ☐	3 ☐	4 ☐	
b.	Our practice feels that Medicare FFS' methodology <u>is fair</u> in how it calculates Comprehensive Primary Care Payments (CPCPs)	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

NON-CMS CPC+ PAYERS – CPC+ PAYMENTS

D4. The next set of questions is about CPC+ payments from non-CMS payers. We define these as CPC+ payers <u>other than CMS/Medicare FFS</u>. These payers may contract in CPC+ for your commercially insured, Medicare Advantage, Medicaid FFS, or Medicaid Managed Care patients.

Below is a list of the non-CMS CPC+ payers in your region. Which of these does your practice contract with, even if you don't receive a separate CPC+ payment from them?

MARK ALL THAT APPLY

☐ [Payer1]

☐ Payer2]

☐ [Payer…]

☐ None of these → **GO TO SECTION E**

D5. The next questions are about <u>CPC+ payments</u> from these payers you indicated your practice contracts with: [*<u>bulleted list of payers marked in D4</u>*]

These payers may provide payments unique to CPC+ or payments made under their patient-centered medical home (PCMH) or value-based programs for your CPC+ patients.

CPC+ payments from these payers can include care management fees; full or partial capitated, global, or bundled payments; or payments that reward cost or quality performance.

Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments across these payers, including the payers that do not provide a separate CPC+ payment?

1 ☐ More than adequate

2 ☐ Adequate

3 ☐ Less than adequate

d ☐ Don't know – not familiar with CPC+ payments from payers or costs of doing CPC+ work

NON-CMS CPC+ PAYERS - CPC+ CAPITATED PAYMENTS

D6. [IF PRACTICE CONTRACTS WITH A PAYER THAT OFFERS CAPITATED PAYMENTS]

This is the payer from your region that provides capitated (per-member per-month (PMPM)) payments in lieu of some or all fee-for-service payments: [*payer marked in D4 that offers capitated payments*].

During the 2019 calendar year, did your practice receive capitated payments from this payer for your CPC+ patients?

Do not include care management fees or performance-based incentive payments (PBIPs) as these are not replacements for fee-for-service payments.

1 ☐ Yes

2 ☐ No → **GO TO QUESTION D8**

D7. [IF D6 = 1; practice received capitated payments]

Please indicate how much you agree or disagree with the following statements about your practice's experience with capitated payments from [*payer marked in D4 that offers capitated payments*].

MARK ONE RESPONSE PER ROW

		STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a.	Our practice has detailed information from this payer on how they calculate the capitated payments	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b.	Our practice understands how this payer calculates the capitated payments	1 ☐	2 ☐	3 ☐	4 ☐	
c.	Our practice feels that this payer's methodology is fair in how they determine the capitated payments	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

NON-CMS CPC+ PAYERS – PAYMENTS FOR PERFORMANCE FOR COMMERCIALLY INSURED PATIENTS

D8. Which of these payers does your practice contract with for your commercially insured patients, even if you don't receive a separate CPC+ payment from them?

MARK ALL THAT APPLY

☐ [Payers marked in D4]

☐ […]

☐ None of these → **GO TO SECTION E**

D9. Payments for performance may refer to payments tied to improving patient experience, quality of care, and/or controlling costs. Payers might refer to these payments as 'performance bonuses,' 'merit based incentive payments,' or 'shared savings.'

Which of these payers offered CPC+ payments for performance in 2019?

MARK ALL THAT APPLY

☐ [Payers marked in D8]

☐ […]

☐ None of these → **GO TO SECTION E**

D10. Which of these payers have provided your practice with the methodology they use to calculate CPC+ payments for performance?

MARK ALL THAT APPLY

☐ [Payers marked in D9]

☐ […]

☐ None of these → **GO TO SECTION E**

D11. [IF AT LEAST ONE PAYER SELECTED IN D10; practice reports they have the methodology to calculate the CPC+ payments for performance from at least one payer that they contract with for their commercially insured patients]

Thinking of these payers that have provided your practice with their CPC+ performance payment methodology, please indicate how much you agree or disagree with the following statements about your practice's experience with CPC+ payments for performance from these payers:

[payers marked in D10]

MARK ONE RESPONSE PER ROW

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. Our practice has detailed information from these payers on how they calculate the CPC+ payments for performance	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b. Our practice understands how these payers calculate the CPC+ payments for performance	1 ☐	2 ☐	3 ☐	4 ☐	
c. Our practice feels that these payers' methodologies are fair in how they determine the CPC+ payments for performance	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

E. LEARNING ACTIVITIES AND ASSISTANCE IN CPC+

These questions are about the learning activities and assistance that the CPC+ National Learning Community and Regional Learning Network provided to this practice site as part of CPC+. Please note, we will NOT share practice-identifiable responses to these questions with the National Learning Community or Regional Learning Network.

[CPC+ TWD PRACTICES - THAT HAVE WITHDRAWN WITHIN ONE YEAR OR LESS: We are aware that this practice site is no longer participating in CPC+. Please answer the questions in this section to the best of your ability based on this practice site's experience when it was participating in CPC+.]

E1. Overall, how would you rate the quality of all services from [NAMES OF REGIONAL LEARNING NETWORK ORGANIZATIONS] in meeting this practice site's CPC+-related needs and helping improve primary care?

MARK ONE ONLY

1 ☐ Excellent

2 ☐ Very good

3 ☐ Good

4 ☐ Fair

5 ☐ Poor

E2. The CPC+ National Learning Community and Regional Learning Network offer assistance to practices in a variety of ways. For each of the following types of assistance that this practice site may have received in the <u>past six months</u>, please rate how useful this assistance has been to this practice site in improving primary care.

MARK ONE RESPONSE PER ROW

		NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	NEVER RECEIVED OR ATTENDED
a.	National webinars	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b.	One-on-one telephone/virtual coaching with this practice site to improve practice processes and workflows	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c.	CPC+ Connect (the online information resource and collaboration website for CPC+)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d.	CPC+ Implementation Guides	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e.	CPC+ Support (CPC+ help desk managed by Telligen)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
f.	Group coaching (coaching with a small number of practices, directed by a practice facilitator)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

E3. [IF HAD CPC+ PAYER PARTNERS]: In addition to the support from the CPC+ National Learning Community and Regional Learning Network, CPC+ payer partners may provide their own support and assistance. For each of the following types of assistance that this practice site may have received from CPC+ payer partners in the past six months, please rate how useful this assistance has been to this practice site in improving primary care.

CPC+ payer partners are payers other than Medicare FFS that participate in CPC+.

MARK ONE RESPONSE PER ROW

		NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	NEVER RECEIVED OR ATTENDED
a.	On-site care manager provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b.	Telephone-based care manager provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c.	Explanation of payers' CPC+ payment methodologies	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d.	Training on how to access data feedback provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e.	Training on how to use data feedback provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
f.	Coaching on how to improve practice processes and workflows	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

F. PRACTICE SITE INVOLVEMENT AND PERCEPTIONS OF CPC+

[CPC+ TWD PRACTICES - THAT HAVE WITHDRAWN WITHIN ONE YEAR OR LESS: We are aware that this practice site is no longer participating in CPC+. Please answer the questions in this section to the best of your ability based on this practice site's experience when it was participating in CPC+.]

F1. Thinking of the different types of staff at this practice site, how involved is each type of staff in implementing CPC+?

MARK ONE RESPONSE PER ROW

	VERY INVOLVED	SOMEWHAT INVOLVED	NOT VERY INVOLVED	NOT AT ALL INVOLVED
a. Medical director or clinician lead at this practice site	1 ☐	2 ☐	3 ☐	4 ☐
b. Physicians	1 ☐	2 ☐	3 ☐	4 ☐
c. Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)	1 ☐	2 ☐	3 ☐	4 ☐
d. Clinical support staff	1 ☐	2 ☐	3 ☐	4 ☐
e. Clerical support staff	1 ☐	2 ☐	3 ☐	4 ☐

F2. Thinking about this practice organization, how involved are system-level leadership (e.g., chief executive officer (CEO) or chief medical officer (CMO)) in implementing CPC+?

0 ☐ Practice site is independent and not part of a system
1 ☐ Very involved
2 ☐ Somewhat involved
3 ☐ Not very involved
4 ☐ Not at all involved

F3. In answering this question, please consider the:

- **Improvements made to the practice site's care delivery,**
- **CPC+ participation requirements (including care delivery, health IT, and reporting requirements), and**
- **CPC+ supports (payments, learning activities, data feedback, and health IT vendor support).**

Given this practice's overall experience participating in CPC+, how likely is it that this practice would participate in CPC+ if this practice could do it all over again?

MARK ONE ONLY

1 ☐ Very likely
2 ☐ Somewhat likely
3 ☐ Not very likely
4 ☐ Not at all likely

F4. How much has participation in CPC+ improved the quality of care that this practice currently provides to its patients?

MARK ONE ONLY

1 ☐ A lot
2 ☐ Somewhat
3 ☐ Not very much
4 ☐ Not at all

F5. How burdensome are the following requirements in CPC+?

MARK ONE RESPONSE PER ROW

	NOT AT ALL BURDENSOME	NOT VERY BURDENSOME	SOMEWHAT BURDENSOME	VERY BURDENSOME	DON'T KNOW
a. Meeting care delivery requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b. Completing care delivery reporting requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
c. Completing financial reporting requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
d. Meeting health IT requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

F6. How useful are the following supports provided by CPC+ in improving primary care? Please consider supports from all payers participating in CPC+.

MARK ONE RESPONSE PER ROW

	NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	DON'T KNOW
a. Financial support	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
b. Learning support	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
c. Data feedback	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
d. Health IT vendor support	0 ☐	1 ☐	2 ☐	3 ☐	d ☐

CPC+ AND CORONAVIRUS PANDEMIC

F7. Please indicate how much you agree or disagree with the following statement.

Your practice was better positioned to meet patients' care needs during the coronavirus pandemic because of your participation in CPC+.

1 ☐ Strongly disagree

2 ☐ Disagree

3 ☐ Neither agree nor disagree

4 ☐ Agree

5 ☐ Strongly agree

F7a. [If F7 = 4 or 5 (“Agree” or “Strongly agree”)] Please describe how participation in CPC+ better positioned your practice to meet patients’ care needs during the coronavirus pandemic.

[Only for treatment practices]

YOUR PRACTICE'S PLANS AFTER CPC+ ENDS

F8. For each of the following care delivery processes, how much of your practice's <u>current process</u> are you likely to maintain after CPC+ ends?

For processes that your practice is not currently doing at all, please select the response option in the first column.

		AFTER CPC+ ENDS, YOUR PRACTICE IS LIKELY TO MAINTAIN…					
		NOT CURRENTLY DOING THIS PROCESS AT ALL	NONE OF THE PROCESS	SOME OF THE PROCESS	A LOT OF THE PROCESS	MOST OR ALL OF THE PROCESS	DON'T KNOW
a.	Risk stratify patients	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b.	Provide short-term ("episodic") care management for patients who had a recent hospital admission or ED visit	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
c.	Work with a care manager to provide proactive, long-term, relationship-based ("longitudinal") care management	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
d.	Use care plans for your high-risk patients that reflect patient preferences, goals, and wishes *Care plans support care management and differ from after-visit summaries*	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
e.	Provide on-site behavioral health care that is integrated into your primary care services	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
f.	Assess patients' health-related social service needs and refer them to community resources	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
g.	Coordinate care with specialists	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
h.	Use formal written agreements with specialists to set expectations about roles and information sharing	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

	AFTER CPC+ ENDS, YOUR PRACTICE IS LIKELY TO MAINTAIN…					
	NOT CURRENTLY DOING THIS PROCESS AT ALL	NONE OF THE PROCESS	SOME OF THE PROCESS	A LOT OF THE PROCESS	MOST OR ALL OF THE PROCESS	DON'T KNOW
i. Ensure a range of options for how and when patients can access primary care from this practice (for example, phone visits or extended office hours)	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
j. Track and use quality measures and other data to guide practice improvements	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
k. Use Patient and Family Advisory Councils (PFAC) to better understand what matters most to patients and to guide improvements at your practice	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

G. PRACTICE SITE CONTACT INFORMATION AND SURVEY COMPLETION

G1. Please provide the following information for this practice site.

Practice Site Name: _____

Physical Street Address: _____

City: _____ State: _____ Zip Code: _____

Practice Site Telephone Number: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

G2. Please provide the name, title, email, and phone number of the person who completed this survey so we know who to contact if we have any questions.

Name: _____

Title: _____

Email: _____

Telephone Number: _____

G3. [Only for treatment withdrawn practices] Please confirm the name and address of the person who should receive the check for completing the survey. You may enter your practice name in the "Name of Check Recipient" field if you prefer that the check be made out to your practice. If you are unable to accept payment, please mark the box that says, "Do not send payment" and leave the remaining fields blank.

☐ Do not send payment

Name of Check Recipient: _____

Address: _____

City: _____ State: _____ Zip Code: _____

G4. Who filled out this survey or provided input to complete this survey?

MARK ALL THAT APPLY

1 ☐ Practice or office manager (e.g., clinic manager, office coordinator, office supervisor)
2 ☐ Lead physician
3 ☐ Other physicians
4 ☐ Nurse practitioner (NP), clinical nurse specialist (CNS), or physician assistant (PA)
5 ☐ Care manager or coordinator
6 ☐ Nursing staff, including nurse manager or supervisor
7 ☐ Medical assistant staff
8 ☐ Quality improvement staff (e.g., quality manager or coach, population health staff)
9 ☐ Administrative support staff (e.g., billing or finance staff, front desk staff)
10 ☐ Non-physician owner of practice
11 ☐ Leadership or staff from our larger health care system or medical group (e.g., CEO, CMO)
12 ☐ Data analytics staff (e.g., EMR analyst, health IT team)
13 ☐ CPC+ lead
14 ☐ Patients
99 ☐ Other (specify) _____

G5. Please add any comments about this survey here. If you have feedback about a specific survey question, please include the question number in your comment.

Thank you for completing the survey!

3.C. Payment policy changes made by payers in response to the COVID-19 pandemic that affected primary care practices

3.C.1. Medicare FFS changes

In response to the coronavirus disease 2019 (COVID-19) pandemic, the U.S. Department of Health and Human Services (HHS) made several key policy changes for Medicare fee-for-service (FFS) coverage and payment (Appendix Table 3.C.1) that affected primary care practices. While most of these changes applied to all Medicare providers, not just CPC+ practices, their financial impact on CPC+ practices was substantial. The HHS coverage waivers described below are expected to remain in place at least through 2021.

Table 3.C.1. Medicare FFS payment policy changes in response to the pandemic

Telehealth coverage	Before the pandemic	During the pandemic
Location	**Restricted to rural beneficiaries and telehealth visits originating from a health care setting,** such as a clinic or doctor's office.	**Restriction lifted.** Telehealth covered for beneficiaries **living anywhere,** and for services originating from **any geographic location,** including their homes.
Types of providers eligible for payment	Only **physicians and certain other practitioners** (for example, physician assistants). *Providers in certain settings (for example, FQHCs) were ineligible.*	**Restrictions lifted.** **Any health provider, in any setting,** can be reimbursed for telehealth.
Technology required	**Two-way audio/video communication.** *Smartphone or audio-only telephones not permitted.*	**Any type of interactive audio-video system, including smartphones, permitted.** *A limited number of telehealth services can be provided via audio-only telephone or smartphones without video.*
Payment rates	For the limited set of services approved for telehealth coverage, Medicare FFS payment rate was on par with office visits.	For the expanded services approved for telehealth, **Medicare FFS payment rate remains on par with office visits.**
Other key payment policies	**Before the pandemic**	**During the pandemic**
Patient cost sharing	**When receiving services from participating providers,[a] beneficiaries with Part B coverage were subject to a deductible and 20 percent coinsurance for Medicare-covered services.** Supplemental insurance[b] may have covered some or all of these cost-sharing requirements.	**Standard cost sharing (deductible and 20 percent coinsurance) still applies, with these exceptions:** COVID-19 treatment: for monoclonal antibody treatment specifically, zero cost sharing applies. Telehealth: Providers granted flexibility by HHS to reduce or waive cost sharing during the pandemic.

Table 3.C.1 ***(continued)***

Other key payment policies	Before the pandemic	During the pandemic
Temporary financial supports provided to practices	Not applicable.	CPC+ practices could request **2020 Q3 non-claims-based payments (care management fees, Comprehensive Primary Care Payments) to be paid in advance.** For CPC+ and non-CPC+ practices: The **CARES Act Provider Relief Fund** provided grants and other financial assistance, which providers could use to compensate for revenues lost due to the pandemic. The Payroll Protection Program provided loans that could be forgiven to employers with 500 or fewer employees to maintain staffing and salary levels. CMS provided accelerated and advanced payments to Medicare Part A and Part B suppliers.

Source: Koma W., J. Cubanski, T. Neuman. "Medicare and Telehealth: Coverage and Use During the COVID-19 Pandemic and Options for the Future." Kaiser Family Foundation. May 19, 2021. https://www.kff.org/coronavirus-covid-19/issue-brief/faqs-on-medicare-coverage-and-costs-related-to-covid-19-testing-and-treatment/.

[a] Medicare participating providers, who account for nearly all services billed under Medicare Part B, are providers that "accept assignment" (meaning that they accept Medicare's approved amount for health care services as full payment, and agree not to balance-bill patients). Beneficiaries receiving services from other providers (nonparticipating providers or opt-out providers) may pay higher out-of-pocket costs.

[b] More than 80 percent of Medicare FFS beneficiaries have supplemental coverage (such as Medigap, retiree health benefits, or Medicaid) that covers some or all of their cost-sharing requirements.

FFS = fee-for-service; FQHC = Federally Qualified Health Center.

3.C.2. CPC+ payer partners' payment changes

The PY (Program Year) 4 CPC+ Payer Survey asked CPC+ payer partners how they modified their payment approaches in response to the COVID-19 pandemic, including patient cost-sharing policies, telehealth reimbursement, and temporary financial support to practices:[17]

A. Patient cost-sharing policies

Most of the 48 payer partners that responded to survey questions about COVID-19 required no patient cost sharing during the pandemic for either COVID-19 treatment or primary care telehealth services.

- Cost sharing for COVID-19 treatment: 44 of 48 payer partners (92 percent) required no cost sharing for primary care COVID-19 treatment. Among these 44 payers:
  - 12 payers already required no cost sharing for primary care services prior to the pandemic; these payers did not need to implement any cost-sharing waivers specifically for COVID-19 treatment. This approach was far more common in the Medicaid managed care and Medicaid FFS lines of business (LOBs) than in other LOBs.

[17] We note data patterns by lines of business (LOBs) only when these differ from overall patterns for all payer partners.

  - 32 payers waived all cost sharing related to COVID-19 treatment. This was the predominant approach among commercial payers.
- Cost sharing for primary care telehealth services: 40 of 48 payer partners (83 percent) required no cost sharing for primary care telehealth services. Among these 40 payers:
  - 13 payers already required no cost sharing for primary care telehealth prior to the pandemic. Again, this approach was far more common in the Medicaid managed care and Medicaid FFS LOBs than in other LOBs.
  - 27 payers waived all cost sharing for primary care telehealth. Among commercial payers, this was the most common approach.

B. Reimbursement for telehealth services

Many payer partners increased coverage of and reimbursement for telehealth services to help patients access care remotely and practices maintain their revenues.

- **Types of visits covered:** During the pandemic, all 48 CPC+ payer partners (100 percent) responding to the COVID-19 survey questions reimbursed for primary care telehealth visits conducted by physicians and non-physician staff (defined as nurse practitioners, physician assistants, or others). In addition, 46 of these 48 payer partners (96 percent) reimbursed for *behavioral health* telehealth visits conducted by primary care staff during the pandemic.
  - Half of the 48 payer partners expanded telehealth coverage for at least one type of telehealth visit (for example, physician, non-physician, or behavioral health visit) in response to the pandemic. The remaining half of payer partners already covered primary care telehealth visits prior to the pandemic, and continued to do so.
- Types of telehealth technologies covered: All 48 payers (100 percent) reimbursed for telehealth using HIPAA-compliant technology during the pandemic.
  - Prior to the pandemic, 44 payers (92 percent) already were reimbursing for HIPAA-compliant technology, so reimbursing for these visits represented a change only for 4 payers (8 percent).
  - However, the federal waiver that allowed non-HIPAA-compliant technology to be used for telehealth during the pandemic led to widespread reimbursement changes: 45 payers (94 percent) started reimbursing for non-HIPAA-compliant video technology—such as FaceTime or Zoom—and 39 payers (81 percent) started reimbursing for telehealth conducted by telephone.
- Reimbursement rates for telehealth: During the pandemic, 39 of 48 payers (81 percent) reimbursed all primary care telehealth visits at rates on par with in-person, office-based visits. Among these 39 payers:
  - 19 payers increased their reimbursement rates compared to their pre-pandemic rates; the remaining 20 payers already reimbursed for primary care telehealth on par with office-based visits prior to the pandemic. Commercial payers were more likely to have increased

telehealth reimbursement rates in response to the pandemic, while Medicaid payers tended to offer parity prior to the pandemic.

C. Temporary financial supports

Thirty-nine of the 48 payers surveyed (78 percent) offered temporary financial supports or interim payment programs as a way to ease practices' cash flow and financial pressure, during a period when FFS volume suddenly and dramatically declined. Among these 39 payers:

- 28 payers provided accelerated payments to primary care practices—for example, offering care management fees or capitation payments ahead of schedule. This approach mirrored CMS's advanced 2020 Q3 payments for care management fees and Comprehensive Primary Care Payments, and was the most common temporary support provided to practices in 2020.
- Payers also offered other temporary financial supports to primary care practices, including: easing requirements for earning performance-based payments (12 payers) and postponing recoupment of funds owed by practices or providers (11 payers).

As the pandemic evolves, payers continue to adjust their payment policies—for example, discontinuing some temporary financial supports while making some telehealth coverage expansions permanent. Policymakers also are mandating payment policy changes. Among the notable policy changes to date, 10 states have added a requirement for reimbursement parity between telemedicine and in-person visits (Volk et al. 2021). In the PY 5 Payer Survey and payer interviews, we will continue to track changes made by CPC+ payer partners, which we will summarize in the fifth annual report.

3.D. Challenges regions experienced aggregating data in PY 4

We asked data aggregating organizations (referred to as data aggregators) in CPC+ regions with active data aggregation efforts about challenges aggregating data and strategies to overcome these.

- **In PY 4, data aggregators in most regions continued to cite lags in claims data and concerns about sharing cost data as key challenges in developing aggregated feedback.** Data aggregators in these regions also expressed these challenges in previous program years. Lags in claims data availability—due to the time between service delivery, claims submission and processing, and calculation of claims-based measures—have continued to limit the actionability of aggregated claims data feedback. As reported in previous program years, lags are exacerbated by aggregation, which requires aligning multiple payers' data submissions. In PY 4, data aggregators in three regions sought to supplement claims data with more timely data, such as admissions, discharge, and transfer (ADT) notifications or richer data sources such as health data feeds from Health Information Exchanges to improve actionability of data in tools. Payer partners also remain concerned about submitting their cost data and antitrust liability issues because cost data could give insight into payers' contracting arrangements and negotiations with providers. A data aggregator in one region cited concerns from payer partners about sharing cost information as the key reason the region was unable to aggregate claims data in PY 4.
- **Data aggregators in three regions also reported a couple of new challenges in producing aggregated data feedback in PY 4.** First, data aggregators in two regions described the difficulty of aggregating data across payer partners that use different data file formats. Additionally, some payer partners have developed their own enterprise-specific reports that are not aligned with data aggregators' requirements and require additional coordination efforts. Second, data aggregators in three regions described difficulties creating practice-level reports when payer partners' claims data are missing information on the facility or location of where practitioners delivered care. To help the data aggregators in these regions, CMS provided them with a list of practitioners affiliated with each CPC+ practice in the region. Data aggregators reported that having these practitioner lists has made constructing practice-level reports easier.

3.E. Data aggregators' perspectives on practices' use of aggregated data feedback

Data aggregators in most regions reported that smaller practices faced greater challenges using aggregated data feedback tools. During our interviews with data aggregators in CPC+ regions, data aggregators in four regions reported the difficulty smaller practices, in particular, faced in utilizing aggregated data feedback tools due in part to limited resources and fewer staff to dedicate to using tools. As a data aggregator in one region noted, the aggregated feedback tool was a "very heavy lift," particularly for smaller practices and individual practices where "there was…no real resource at the provider level to take full advantage of the data feedback tool" given the extensive functionality and large volume of information in the tool.

To improve practices' engagement with aggregated data feedback tools, regions have tailored data feedback supports to meet the needs of individual practices. One region developed and sent practices a static report, summarizing performance on four measures, after the data aggregator realized that some practices were not fully engaging with the dynamic tool because they did not have the time or did not know how to use the tool. The static report included only four measures and did not have drill-down capabilities but provided a starting point for these practices to learn how to interpret data feedback. Other regions have helped practices to identify ways to use data feedback to improve the delivery of preventive services or to close gaps in care. For example, one region worked with a practice to improve the rate of breast cancer screening among its Medicaid patients after identifying a quality gap from aggregated claims data.

3.F. Changes to CMS's overall CPC+ learning strategy from PY 1 to PY 4

CMS adapted learning goals and strategies over time. In PYs 1 and 2, CMS provided similar content across all regions and learning contractors monitored practice performance on process measures. In PY 3, there was a significant change in strategy toward greater flexibility in adapting the learning supports in each region and helping practices improve outcome measures. In PY 4, CMS continued this shifted focus and contractors began adapting the learning supports to reach more practices through durable products. In PY 4, learning contractors also began to provide CPC+ practices with information about ways to sustain CPC+ learning supports.

	Program Years 1 and 2	Program Year 3	Program Year 4
Regional adaptation	Learning supports covered similar content across all regions	Practice facilitators had more *flexibility* to adapt learning supports to the needs of practices in their regions	CMS continued to provide flexibility in adapting the learning supports
Focus of practice performance	Learning contractors monitored practice performance using process measures that reflected whether practices met model requirements	Learning supports focused on helping practices improve *outcome measures* through innovative care transformation activities	Learning supports continued to focus on improving *outcome measures*. As a result of the COVID-19 pandemic, CMS decided to focus quality improvement efforts on the CMS 155 and 122 eCQMs (diabetes blood sugar level and high blood pressure control).
Peer learning		Learning supports highlighted the expertise of practices through *peer learning*	Learning contractors continued to prioritize and facilitate *peer learning*
Durable products			CMS increased the level of resources going towards *durable products* that reach many practices at once
Sustainability			Learning contractors began discussing how practices can *sustain the changes* they have made after CPC+ ends

3.G. Practice and practice facilitator experiences with learning supports

Deep-dive practices and practice facilitators reported that they found learning supports valuable resources for providing information, facilitating peer learning, and providing highly personalized support.

- **As in previous years, practices and their practice facilitators said durable products such as the Implementation Guide and CPC+ Connect were helpful resources that provided comprehensive information they can refer to frequently.** Among the 34 deep-dive practices that were asked which learning supports were most helpful, a couple said they found the Implementation Guide especially useful during the beginning of the COVID-19 pandemic, when most other learning supports were paused.
- **Many deep-dive practices and learning contractors valued Regional Implementation Networking Groups (RINGs) and regional learning sessions for their focus on peer learning and knowledge sharing.** Five of the 14 learning contractors interviewed described how RINGs enhance peer learning in different ways, depending on the type of RING. For example, practice facilitators reported that attendees of peer-based RINGs get to know each other over a long period of time, which results in a supportive environment with more open sharing among practices. Practice facilitators also reported that cross-regional RINGs are particularly helpful for regions with fewer CPC+ practices because practices can hear from new and diverse practices. A few practices described how the immersive and in-person format of regional learning sessions improved their experience by eliminating distractions, which leads to better networking and learning.
- **Practice coaching provided opportunities for both peer learning and personalized support, which many deep-dive practices and several practice facilitators valued.** Practices appreciated that, during practice coaching sessions, practice facilitators coordinated peer learning by connecting similar practices to each other, conducting coaching sessions in small groups, and disseminating insights and ideas from other practices. But they also valued how practice facilitators gave them highly individualized, one-on-one support where they needed it, such as helping them understand data feedback reports, educating their providers on quality measures, or answering their questions and concerns about model requirements. Deep-dive practices said that, compared with other learning supports, practice facilitators were most likely to give them direct, tailored, thorough, and quick responses. Several practice facilitators also found that the relationships they developed through coaching enabled them to tailor other learning supports to the needs of their regions, such as RINGs and learning sessions.

Although practice facilitators and practices gave positive feedback about CPC+ Connect and practice coaching overall, they described a few challenges with these supports.

- **Practices find CPC+ Connect helpful, but also encounter technical challenges that limit its utility.** Half of the eight practice facilitators interviewed reported that practices less often use CPC+ Connect to engage in conversations and share information with other practices;

they noted that practices have different reasons for not posting information, including preferring to read posts rather than post themselves, or finding it easier to directly communicate with their practice facilitator rather than post on CPC+ Connect. Several deep-dive practices echoed these challenges.

- A few deep-dive practices did not find value in practice coaching. These practices said they found it difficult to communicate with their practice facilitators, because the practice facilitators were new and/or kept changing, or because the practice facilitator did not provide tailored, thorough, or quick responses.

3.H. Practice characteristics associated with their perceptions of usefulness of vendor support and burden of meeting health IT requirements

Practices' perceptions of the usefulness of health IT vendor support and the burden of meeting health IT requirements varied by practice and vendor characteristics:

- **Single or multiple vendors.** Practices partnering with multiple EHR vendors were more likely than those with a single vendor (65 versus 43 percent of practices) to report that requirements were somewhat or very burdensome. This may reflect that practices seek out additional vendors due to perceived shortcomings in their main vendor's product, or it may reflect the added burden of navigating multiple vendor partnerships. Practices' likelihood of reporting that support was very or somewhat useful did not vary according to the number of vendor partners.
- **Practice size.** Small practices were 11 percentage points more likely than large practices to perceive that health IT vendor support was somewhat or very useful and also 11 percentage points more likely to perceive that meeting requirements was somewhat or very burdensome.
- **Track.** Practices in both tracks had similar perceptions of the usefulness of vendor support, despite Track 2 practices having a more formal relationship with their vendors. Although Track 2 practices must meet more advanced health IT functionalities than Track 1 practices, they were less likely than Track 1 practices to report that doing so was burdensome (43 versus 51 percent).
- **Region.** The percentage of practices that indicated meeting health IT requirements was burdensome ranged from 36 percent of practices in New York to 71 percent in Oklahoma, and the percentage indicating that support was somewhat or very useful varied from 37 percent of practices in Montana to 90 percent in Kansas City.
- **Vendor.** Ratings of usefulness and burden varied widely by which major commercial vendor practices partnered with (50 to 82 percent, and 32 to 75 percent, respectively). Myriad factors influence practices' choice of vendor partners, including their size, affiliation with other organizations (such as health systems and independent practice associations), and budget.

Practices' perceptions of usefulness and burden did not vary meaningfully by other practice characteristics (system affiliation, participation in the Medicare Shared Savings Program, prior history with primary care transformation, or urbanicity), or by whether the practice had changed vendors between PY 3 and PY 4.

This page has been left blank for double-sided copying.

APPENDIX 4

4.A. Care Delivery Requirement Data That CPC+ Practices Reported to CMS in 2020: CPC+ Practices That Started in 2017

This Appendix contains detailed information on practices' approaches to delivering care, based on Mathematica's analysis of the CPC+ Practice Portal data for practices that began CPC+ in 2017. CMS requires active CPC+ practices to submit responses online twice a year about care delivery requirements and related practice activities, using the CPC+ Practice Portal.[18] These data are used to track practices' progress on the CPC+ care delivery functions and may be used to judge compliance and to inform learning activities. Practices self-report the data to CMS.

Table 4.A.0 lists the number of practices active in CPC+ in each program year through the end of 2020, the fourth program year. Practices are listed overall and by track and Medicare Shared Savings Program (SSP) status. In this Appendix, we present CPC+ Practice Portal data from Quarter 4 of 2020 for practices that started CPC+ in 2017 and were still active as of December 30, 2020; the data reflect the experiences of practices at the end of Program Year (PY) 4.

Table 4.A.0. Participation in CPC+ for 2017 Starters, by track and SSP status

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Baseline (January 1, 2017)	2,905	1,385	738	647	1,520	616	904
End of Program Year 1 (December 31, 2017)	2,786	1,310	689	621	1,476	587	889
End of Program Year 2 (December 31, 2018)	2,716	1,271	724	547	1,445	622	823
End of Program Year 3 (December 31, 2019)	2,675	1,229	660	569	1,446	651	795
End of Program Year 4 (December 31, 2020)	2,599	1185	606	579	1414	657	757

Source: Mathematica's analysis of 2017 CPC+ practice tracking data provided by CMS.

Note: Participation status in an SSP reflects status at the beginning of the year.

SSP = Medicare Shared Savings Program.

Although CPC+ requirements are based on track and starting year, every practice must answer the same CPC+ Practice Portal questions. However, some questions include skip patterns. Therefore, it is important to note denominators when interpreting the percentage of practices with a particular response.

We generally present the wording and organization of the questions and responses exactly as they appear in the CPC+ Practice Portal, recognizing that these factors could influence interpretation and practices' responses. To facilitate comparisons to the Care Delivery Reporting Guide, we have numbered our Appendix tables to correspond with survey question numbers in the guide. (We do not include a table for every question.) Acronyms CMS used in the question stem or response options are defined in the acronyms list. Questions for which Mathematica did additional data manipulation (for example, combining items, applying thresholds, or conducting

[18] In 2017 and 2018, practices reported CPC+ Practice Portal data to CMS quarterly. In 2019, CMS changed these reporting requirements to twice a year, for Quarters 2 and 4. To reduce the reporting burden on practices, CMS also added the option for practices to indicate whether categories of care delivery had changed since the previous quarter and carried over the previous quarter's answers if practices selected "no."

other data-cleaning steps) are indicated in the Notes section. Percentages may not sum to totals due to rounding.

Data for PYs 1, 2, and 3 for practices that started CPC+ in 2017 are available in the Appendices for the first, second, and third annual CPC+ reports and are not repeated here. Comparisons over time should be made with caution, for two reasons. First, the wording and response options for many CPC+ Practice Portal questions changed over time. Second, the sample changed over time. In this year's Appendix, we report responses to CPC+ Practice Portal questions based on the 2,594 CPC+ practices that submitted CPC+ Practice Portal data at the end of PY 4 (out of the 2,599 CPC+ practices active at the end of PY 4). In the Appendix to the previous report (Orzol et al. 2021), we reported responses to CPC+ Practice Portal questions based on the 2,674 practices that submitted data at the end of PY 3 (out of the 2,675 practices that were active at the end of PY 3.)

Table 4.A.1.1. Access and continuity: Empanelment, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
What is your active patient lookback period?							
Less than one year	1%	2%	2%	2%	1%	<1%	1%
1-2 years	79%	83%	82%	84%	76%	72%	80%
More than two years	19%	15%	17%	14%	22%	27%	19%
N	2,594	1,182	603	579	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.
SSP = Medicare Shared Savings Program.

Table 4.A.1.2. Access and continuity: 24/7 access, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Does a clinician or care team member from your practice site usually provide 24/7 coverage?							
No, we do not provide 24/7 coverage	<1%	0%	0%	0%	<1%	<1%	<1%
Yes	81%	80%	76%	83%	82%	81%	82%
No, we have a centralized call-center for our health system (after-hours coverage for all practices in the system)	16%	17%	20%	14%	15%	17%	14%
No, we have a formal coverage arrangement with another practice/organization	3%	4%	4%	3%	3%	2%	4%
N	2,594	1,182	603	579	1,412	656	756
Is 24/7 coverage provided with real-time access to your practice's EHR?							
No	<1%	<1%	<1%	<1%	<1%	0%	<1%
Yes	100%	100%	100%	100%	100%	100%	100%
N	2,592	1,182	603	579	1,410	655	755

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.1.3. Access and continuity: Continuity of care, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Do you track continuity of care (in terms of how often patients see the practitioner or care team to which they are empaneled) for your patients?							
No	<1%	1%	1%	1%	<1%	<1%	<1%
Yes	99%	99%	99%	99%	99%	99%	99%
N	2,594	1,182	603	579	1,412	656	756
What system(s) do you primarily use to track continuity of care? (Select all that apply)							
EHR	92%	93%	94%	91%	91%	94%	89%
Electronic practice management systems (e.g., appointment scheduling system)	28%	27%	25%	29%	28%	25%	31%
Other	10%	9%	7%	10%	12%	9%	14%
N	2,571	1,169	596	573	1,402	651	751

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.1.4.a. Access and continuity: Enhanced access and communication, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
When patients need it, my practice is able to provide same or next-day appointments							
Never	0%	0%	0%	0%	0%	0%	0%
Rarely	<1%	<1%	0%	<1%	<1%	0%	<1%
Sometimes	1%	1%	<1%	2%	1%	<1%	2%
Often	19%	19%	21%	17%	20%	19%	20%
Always	79%	79%	78%	80%	79%	81%	77%
N	2,594	1,182	603	579	1,412	656	756
When patients need it, my practice is able to provide office visits on the weekend, evening, or early morning							
Never	7%	8%	6%	11%	5%	4%	7%
Rarely	4%	5%	4%	5%	4%	4%	4%
Sometimes	12%	13%	11%	15%	11%	9%	12%
Often	25%	25%	26%	24%	25%	26%	23%
Always	52%	49%	53%	45%	55%	57%	54%
N	2,594	1,182	603	579	1,412	656	756
When patients need it, my practice is able to provide email or portal advice on clinical issues							
Never	2%	4%	4%	4%	<1%	2%	<1%
Rarely	2%	3%	2%	3%	1%	1%	1%
Sometimes	6%	8%	7%	9%	5%	5%	4%
Often	13%	12%	12%	12%	15%	14%	16%
Always	76%	73%	75%	72%	79%	79%	78%
N	2,594	1,182	603	579	1,412	656	756
In the last two quarters, in which ways have you used the flexibility of CPC+ payments to deliver care in ways that you could not under FFS? (Select all that apply)							
None	6%	13%	12%	14%	<1%	0%	<1%
Visits to hospitals, nursing facilities, or other locations by any staff as part of care management and coordination	32%	28%	28%	28%	35%	33%	37%
Visits in the home by designated staff for care management activities, home assessments, education, or self-management support	33%	23%	24%	22%	41%	46%	36%

Table 4.A.1.4.a *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Practice group visits for purposes of disease management, self-management and other support	26%	20%	19%	20%	31%	27%	35%
Video-based conferencing for primary care visits (i.e., telehealth or telemedicine)	60%	49%	53%	45%	69%	67%	71%
Practitioner visit over an electronic exchange (i.e., phone or, e-visit, portal, e-mail)	74%	60%	60%	59%	85%	87%	84%
Either video-based conferencing or practitioner visit over an electronic exchange	79%						
Patient outreach by community health worker, health coach, and/or caregiver support staff	64%	56%	57%	55%	70%	76%	65%
Other	21%	18%	16%	20%	24%	20%	27%
N	2,594	1,182	603	579	1,412	656	756
How are you delivering the following care- Visits to hospitals, nursing facilities, or other locations by any staff as part of care management and coordination							
Potentially available to all patients	70%	71%	68%	74%	70%	70%	70%
Targeting high risk patients only	30%	29%	32%	26%	30%	30%	30%
N	829	334	170	164	495	217	278
How are you delivering the following care - Visits in the home by designated staff for care management activities, home assessments, education, or self-management support							
Potentially available to all patients	37%	40%	35%	46%	35%	31%	40%
Targeting high risk patients only	63%	60%	65%	54%	65%	69%	60%
N	853	277	147	130	576	303	273
How are you delivering the following care - Practice group visits for purposes of disease management, self-management and other support							
Potentially available to all patients	68%	61%	54%	68%	72%	63%	78%
Targeting high risk patients only	32%	39%	46%	32%	28%	37%	22%
N	669	231	114	117	438	177	261
How are you delivering the following care - Video-based conferencing for primary care visits (i.e., telehealth or telemedicine)							
Potentially available to all patients	97%	97%	98%	95%	98%	96%	99%
Targeting high risk patients only	3%	3%	2%	5%	2%	4%	1%
N	1,549	577	319	258	972	439	533

Table 4.A.1.4.a *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
How are you delivering the following care - Practitioner visit over an electronic exchange (i.e., phone or, e-visit, portal, e-mail)							
Potentially available to all patients	97%	95%	96%	94%	97%	99%	96%
Targeting high risk patients only	3%	5%	4%	6%	3%	1%	4%
N	1,913	706	363	343	1,207	572	635
How are you delivering the following care - Patient outreach by community health worker, health coach, and/or caregiver support staff							
Potentially available to all patients	60%	58%	63%	53%	62%	65%	58%
Targeting high risk patients only	40%	42%	37%	47%	38%	35%	42%
N	1,650	659	342	317	991	498	493

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

FFS = fee-for-service; SSP = Medicare Shared Savings Program.

Table 4.A.1.4.b. Access and continuity: Enhanced access and communication, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
On a scale of one to five (1 = not considered; 3 = fully considered; 5 = fully implemented), rate the extent you have implemented this tactic to support care that is unconstrained by FFS billing: Adjusted care team schedules, workload and workflow to accommodate care that is unconstrained by fee-for-service							
1 – Not considered	5%	9%	6%	12%	2%	2%	2%
2	4%	3%	3%	3%	5%	4%	6%
3 – Fully considered	27%	25%	28%	23%	27%	24%	30%
4	16%	16%	15%	16%	16%	13%	18%
5 – Fully implemented	49%	47%	48%	46%	50%	56%	44%
N	2,437	1,028	528	500	1,409	656	753
On a scale of one to five (1 = not considered; 3 = fully considered; 5 = fully implemented), rate the extent you have implemented this tactic to support care that is unconstrained by FFS billing: Determined new documentation approach that is necessary and sufficient for clinical care.							
1 – Not considered	14%	14%	13%	15%	13%	5%	20%
2	6%	5%	6%	4%	6%	4%	7%
3 – Fully considered	27%	23%	21%	26%	29%	40%	20%
4	14%	15%	16%	15%	13%	10%	15%
5 – Fully implemented	40%	42%	43%	40%	39%	40%	37%
N	2,437	1,028	528	500	1,409	656	753
On a scale of one to five (1 = not considered; 3 = fully considered; 5 = fully implemented), rate the extent you have implemented this tactic to support care that is unconstrained by FFS billing: Adjusted compensation formulas for your providers and/or care teams to recognize either the time spent on activities that don't generate RVUs or to recognize activities that result in an improvement in patient outcomes from these activities.							
1 – Not considered	22%	26%	22%	31%	19%	14%	24%
2	9%	9%	9%	9%	9%	13%	7%
3 – Fully considered	25%	28%	29%	27%	23%	24%	21%
4	14%	10%	9%	12%	17%	17%	18%
5 – Fully implemented	29%	26%	31%	21%	32%	32%	31%
N	2,437	1,028	528	500	1,409	656	753
On a scale of one to five (1 = not considered; 3 = fully considered; 5 = fully implemented), rate the extent you have implemented this tactic to support care that is unconstrained by FFS billing: Identified a set of metrics to assess and understand the impact.							
1 – Not considered	10%	13%	13%	14%	8%	2%	13%
2	10%	9%	9%	9%	11%	10%	12%
3 – Fully considered	28%	29%	27%	33%	27%	29%	25%
4	15%	16%	17%	15%	15%	18%	12%
5 – Fully implemented	36%	32%	34%	29%	40%	41%	38%
N	2,437	1,028	528	500	1,409	656	753

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

FFS = fee-for-service; RVU = Relative Value Unit; SSP = Medicare Shared Savings Program.

Table 4.A.2.1. Targeted care management: Risk stratification, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Do you risk stratify your empaneled patients?							
No	<1%	<1%	<1%	<1%	<1%	0%	<1%
Yes	100%	99%	100%	99%	100%	100%	100%
N	2,594	1,182	603	579	1,412	656	756
What factors are included in your data-driven algorithm for risk stratifying your patients? (Select all that apply.)							
We do not use a data-driven algorithm as part of our risk stratification	<1%	1%	<1%	2%	<1%	<1%	<1%
Claims variables	38%	32%	41%	23%	42%	54%	31%
Clinical variables from the EHR	91%	91%	95%	86%	92%	93%	91%
Computed risk scores (e.g., CMS-HCC scores or risk scores from other payers)	54%	52%	52%	53%	55%	54%	56%
Other	18%	15%	10%	20%	20%	21%	19%
N	2,587	1,176	601	575	1,411	656	755
What factors do you consider when using care team/clinical intuition to stratify your patients? Do not include factors included in your data-driven algorithm. (Select all that apply.)							
We do not use the care team's perception as part of our risk stratification	<1%	1%	<1%	2%	<1%	0%	1%
Social needs	94%	93%	98%	88%	95%	99%	92%
Behavioral health needs	91%	92%	93%	91%	90%	88%	93%
Clinical factors	96%	95%	97%	94%	96%	97%	95%
Other	9%	8%	11%	5%	10%	12%	8%
N	2,587	1,176	601	575	1,411	656	755
What prompts reassessment of a patient's risk-stratification assignment?							
We do not reassess the risk stratification of our patients	<1%	<1%	<1%	<1%	0%	0%	0%
Only as needed, or we do not have a protocol in place	6%	5%	3%	7%	6%	6%	6%
Pre-specified clinical events (e.g., new diagnosis, hospitalization)	25%	30%	27%	33%	21%	19%	23%
Automatically updated when new information is in the health IT or EHR platform	34%	30%	36%	24%	37%	47%	29%

Table 4.A.2.1 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Schedule-driven protocol	24%	25%	22%	27%	23%	21%	24%
Other	11%	10%	11%	9%	12%	6%	18%
N	2,587	1,176	601	575	1,411	656	755
What prompts reassessment of a patient's risk-stratification assignment? - Schedule-driven protocol							
Each patient visit	31%	36%	21%	49%	27%	23%	30%
Multiple times a year	30%	29%	36%	23%	32%	27%	35%
Annually	29%	31%	37%	25%	28%	23%	32%
Other	9%	4%	6%	3%	13%	26%	3%
N	614	291	135	156	323	141	182
Is risk stratification integrated within your EHR or health IT system?							
No	4%	6%	4%	8%	2%	2%	2%
Yes	96%	94%	96%	92%	98%	98%	98%
N	2,587	1,176	601	575	1,411	656	755

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

EHR = electronic health record; HCC = Hierarchical Condition Category; SSP = Medicare Shared Savings Program.

Table 4.A.2.2.a. Targeted care management: Identifying patients for care management, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Indicate how you identify patients for episodic care management. This refers to short-term care management for patients who are not already in longitudinal care management. (Select all that apply.)							
We do not identify patients for episodic care management	<1%	0%	0%	0%	<1%	<1%	0%
Practitioner or care team referral	87%	83%	86%	81%	90%	92%	87%
Hospital admission or discharge	99%	98%	98%	98%	99%	98%	100%
ED visit	96%	96%	98%	93%	96%	97%	94%
Skilled Nursing Facility (SNF) admission or discharge	70%	69%	76%	61%	71%	78%	65%
New health condition (e.g., cancer)	79%	79%	80%	78%	79%	78%	80%
New clinical instability in a chronic condition, including change in medications	74%	73%	73%	72%	75%	75%	75%
Life event (e.g., death of spouse, financial loss)	58%	56%	58%	54%	60%	59%	62%
Initiation or stabilization on a high-risk medication (e.g., anticoagulants)	50%	50%	55%	45%	50%	52%	49%
Other	10%	10%	12%	8%	11%	12%	10%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

ED = emergency department; SNF = Skilled Nursing Facility; SSP = Medicare Shared Savings Program.

Table 4.A.2.2.b. Targeted care management: Identifying patients for care management, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Tier 1 (Highest risk)							
Median percentage of empaneled patients in risk tier	2.69	3.08	3.61	2.38	2.43	2.94	1.955
Median percentage of patients in risk tier receiving longitudinal care management	30.84	29.55	25.45	34.48	31.25	30.84	31.90
N	2,504	1,125	574	551	1,379	631	748
Tier 2							
Median percentage of empaneled patients in risk tier	10.03	11.01	11.73	9.52	9.47	10.16	8.99
Median percentage of patients in risk tier receiving longitudinal care management	9.42	9.37	8.52	9.84	9.57	9.54	9.59
N	2,555	1,174	600	574	1,381	655	726
Tier 3							
Median percentage of empaneled patients in risk tier	44.33	44.33	49.53	36.69	44.32	49.88	40.41
Median percentage of patients in risk tier receiving longitudinal care management	1.55	1.19	0.94	1.84	1.87	2.33	1.52
N	25	1,170	599	571	1,360	623	737
Tier 4+							
Median percentage of empaneled patients in risk tier	58.73	57.80	52.86	62.25	59.66	52.92	64.20
Median percentage of patients in risk tier receiving longitudinal care management	0.46	0.34	0.19	0.59	0.55	0.63	0.46
N	1,470	653	297	356	817	377	440

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

Note: We combine all tiers below the three highest risk tiers and recalculate the percentage of empaneled patients and the percentage of patients receiving longitudinal care management for this group

SSP = Medicare Shared Savings Program.

Table 4.A.2.3. Targeted care management: Care management staffing and activities, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity - Assessing and reassessing patient risk status							
None	0%	0%	0%	0%	0%	0%	0%
Practitioner (i.e., MD, DO, NP, PA)	61%	56%	54%	57%	64%	65%	64%
Care manager/clinical staff (e.g., RN, LPN, social worker)	29%	36%	40%	31%	24%	27%	22%
Other clinical staff (e.g., MA/CMA, CNA)	3%	4%	<1%	6%	3%	3%	3%
Non-clinical staff (e.g., admin, front desk)	<1%	<1%	<1%	1%	<1%	<1%	<1%
Other	6%	4%	4%	4%	9%	6%	11%
N	2,593	1,181	603	578	1,412	656	756
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Monitoring and management of care transitions (hospital, ED discharges)							
None	0%	0%	0%	0%	0%	0%	0%
Practitioner (i.e., MD, DO, NP, PA)	12%	12%	11%	12%	13%	13%	13%
Care manager/clinical staff (e.g., RN, LPN, social worker)	69%	68%	70%	65%	69%	73%	66%
Other clinical staff (e.g., MA/CMA, CNA)	13%	14%	11%	17%	11%	12%	11%
Non-clinical staff (e.g., admin, front desk)	1%	2%	2%	2%	1%	0%	2%
Other	5%	5%	5%	4%	5%	3%	7%
N	2,593	1,181	603	578	1,412	656	756
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Medication reconciliation during transitions of care (hospital, ED discharges)							
None	<1%	<1%	<1%	0%	<1%	<1%	0%
Practitioner (i.e., MD, DO, NP, PA)	33%	39%	42%	35%	29%	28%	30%
Care manager/clinical staff (e.g., RN, LPN, social worker)	48%	44%	43%	44%	52%	55%	50%
Other clinical staff (e.g., MA/CMA, CNA)	11%	13%	10%	17%	9%	7%	11%
Non-clinical staff (e.g., admin, front desk)	<1%	0%	0%	0%	<1%	0%	<1%
Other	7%	4%	5%	4%	10%	11%	9%
N	2,593	1,181	603	578	1,412	656	756

Table 4.A.2.3 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Developing and monitoring care plans							
None	<1%	1%	<1%	1%	<1%	<1%	<1%
Practitioner (i.e., MD, DO, NP, PA)	31%	33%	37%	29%	29%	29%	29%
Care manager/clinical staff (e.g., RN, LPN, social worker)	65%	62%	59%	64%	67%	67%	67%
Other clinical staff (e.g., MA/CMA, CNA)	1%	1%	<1%	2%	1%	<1%	1%
Non-clinical staff (e.g., admin, front desk)	<1%	<1%	0%	<1%	<1%	<1%	0%
Other	3%	3%	2%	3%	3%	3%	3%
N	2,593	1,181	603	578	1,412	656	756
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Providing condition-specific patient education and self-management support							
None	<1%	<1%	0%	<1%	<1%	0%	<1%
Practitioner (i.e., MD, DO, NP, PA)	27%	30%	26%	33%	25%	25%	25%
Care manager/clinical staff (e.g., RN, LPN, social worker)	59%	58%	67%	50%	60%	60%	60%
Other clinical staff (e.g., MA/CMA, CNA)	6%	7%	4%	11%	5%	6%	5%
Non-clinical staff (e.g., admin, front desk)	<1%	<1%	0%	<1%	0%	0%	0%
Other	7%	4%	3%	6%	9%	9%	10%
N	2,593	1,181	603	578	1,412	656	756
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Coordinating and communicating with specialty care							
None	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Practitioner (i.e., MD, DO, NP, PA)	30%	35%	33%	37%	26%	28%	25%
Care manager/clinical staff (e.g., RN, LPN, social worker)	22%	21%	26%	16%	22%	29%	17%
Other clinical staff (e.g., MA/CMA, CNA)	26%	26%	24%	28%	26%	25%	27%
Non-clinical staff (e.g., admin, front desk)	11%	12%	10%	13%	10%	5%	14%
Other	11%	6%	7%	5%	15%	13%	17%
N	2,593	1,181	603	578	1,412	656	756

Table 4.A.2.3 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
What type of clinician and staff at your practice is/are primarily responsible for the following care management and coordination activity? - Navigating patients to community and social services							
None	<1%	<1%	0%	<1%	0%	0%	0%
Practitioner (i.e., MD, DO, NP, PA)	5%	5%	5%	5%	6%	7%	4%
Care manager/clinical staff (e.g., RN, LPN, social worker)	70%	69%	73%	66%	70%	68%	72%
Other clinical staff (e.g., MA/CMA, CNA)	11%	14%	10%	17%	9%	7%	11%
Non-clinical staff (e.g., admin, front desk)	4%	6%	7%	5%	3%	5%	2%
Other	9%	6%	4%	7%	12%	13%	11%
N	2,593	1,181	603	578	1,412	656	756
Among patients under longitudinal care management, how many have a care plan?							
None	<1%	1%	2%	<1%	<1%	<1%	0%
Some	24%	27%	22%	32%	22%	14%	29%
Most	34%	36%	32%	40%	33%	35%	30%
All	41%	36%	45%	28%	45%	50%	41%
N	2,593	1,181	603	578	1,412	656	756
Do you document and store care plans?							
No	<1%	<1%	<1%	1%	<1%	<1%	<1%
Yes, care plans are integrated with the EHR or other health IT	94%	91%	95%	87%	96%	96%	97%
Yes, care plans are documented and stored, but are not integrated with the EHR or other health IT	5%	8%	4%	12%	3%	4%	3%
N	2,576	1,165	592	573	1,411	655	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

ED = emergency department; EHR = electronic health record; SSP = Medicare Shared Savings Program.; MD = Medical Doctor; DO = Doctor of Osteopathy, NP = Nurse Practitioner; PA = Physician's Assistant; RN = Registered Nurse; LPN = Licensed Practical Nurse; MA/CMA = Medical Assistant / Certified Medical Assistant; CNA = Certified Nursing Assistant.

Table 4.A.3.1. Comprehensiveness and coordination: Coordinated referral managements, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Over the past two quarters, we have ensured coordinated referral management with the following high-frequency referral and/or high-cost specialty care: (select all that apply.)							
We do not ensure coordinated referral management with high-frequency referral and/or high-cost specialty care.	<1%	<1%	<1%	1%	<1%	<1%	<1%
Cardiology	72%	69%	68%	70%	75%	78%	72%
Endocrinology	45%	42%	44%	40%	48%	60%	37%
Gastroenterology	57%	53%	53%	53%	60%	67%	54%
Obstetrics/gynecology	42%	38%	37%	38%	45%	47%	44%
Oncology/hematology	37%	37%	40%	34%	37%	45%	31%
Ophthalmology	44%	43%	42%	45%	45%	45%	44%
Orthopedic surgery	45%	43%	42%	44%	46%	50%	43%
Surgery	41%	39%	44%	35%	43%	52%	36%
Other	60%	58%	54%	63%	61%	57%	65%
N	2,593	1,181	603	578	1,412	656	756
Tool(s) used to ensure coordinated referral management with Cardiology							
Collaborative agreement	75%	74%	77%	70%	77%	73%	80%
E-consult arrangement	20%	18%	21%	16%	20%	28%	14%
Other	16%	19%	15%	24%	13%	10%	16%
N	1,867	811	408	403	1,056	511	545
Tool(s) used to ensure coordinated referral management with Endocrinology							
Collaborative agreement	69%	65%	64%	66%	72%	77%	64%
E-consult arrangement	26%	27%	28%	26%	25%	23%	29%
Other	21%	22%	22%	23%	20%	17%	24%
N	1,172	497	265	232	675	392	283

Table 4.A.3.1 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Tool(s) used to ensure coordinated referral management with Gastroenterology							
Collaborative agreement	68%	66%	66%	66%	69%	71%	68%
E-consult arrangement	21%	18%	18%	17%	23%	26%	19%
Other	23%	26%	25%	28%	21%	12%	31%
N	1,480	629	322	307	851	440	411
Tool(s) used to ensure coordinated referral management with Obstetrics/gynecology							
Collaborative agreement	64%	66%	64%	68%	63%	59%	66%
E-consult arrangement	24%	23%	27%	20%	24%	26%	22%
Other	20%	22%	19%	25%	19%	18%	20%
N	1,083	443	225	218	640	306	334
Tool(s) used to ensure coordinated referral management with Oncology/hematology							
Collaborative agreement	64%	59%	65%	53%	68%	70%	64%
E-consult arrangement	24%	22%	23%	21%	25%	19%	32%
Other	22%	29%	23%	36%	17%	13%	22%
N	966	439	244	195	527	293	234
Tool(s) used to ensure coordinated referral management with Ophthalmology							
Collaborative agreement	73%	74%	82%	67%	72%	76%	68%
E-consult arrangement	16%	15%	16%	14%	17%	15%	19%
Other	21%	19%	12%	26%	22%	17%	27%
N	1,142	513	255	258	629	297	332
Tool(s) used to ensure coordinated referral management with Orthopedic surgery							
Collaborative agreement	67%	63%	66%	61%	70%	71%	69%
E-consult arrangement	22%	19%	18%	21%	24%	23%	24%
Other	23%	31%	29%	33%	18%	11%	24%
N	1,158	504	252	252	654	329	325

Table 4.A.3.1 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Tool(s) used to ensure coordinated referral management with Surgery							
Collaborative agreement	60%	60%	62%	57%	60%	63%	57%
E-consult arrangement	24%	25%	26%	24%	24%	18%	31%
Other	27%	29%	24%	35%	26%	24%	28%
N	1,076	466	263	203	610	338	272
Tool(s) used to ensure coordinated referral management with Other, please specify							
Collaborative agreement	87%	83%	81%	85%	90%	90%	89%
E-consult arrangement	12%	11%	9%	13%	13%	20%	9%
Other	17%	21%	28%	15%	14%	11%	16%
N	1,555	687	323	364	868	377	491

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.
SSP = Medicare Shared Savings Program.

Table 4.A.3.3. Comprehensiveness and coordination: Comprehensive medication management, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Which of the following steps has your practice achieved to implement CMM? (Select all that apply.)							
We have not taken any of these steps yet	15%	32%	33%	31%	<1%	<1%	<1%
Established a plan for identifying patients with CMM needs	70%	51%	55%	47%	85%	88%	83%
Identified or hired personnel for CMM	62%	41%	44%	39%	80%	81%	79%
Trained staff as necessary	68%	46%	44%	49%	86%	90%	82%
Developed workflows and processes	70%	46%	44%	47%	91%	93%	88%
Used measures to monitor and refine CMM	36%	21%	21%	21%	49%	52%	46%
N	2,593	1,181	603	578	1,412	656	756
Count of the above steps your practice achieved to implement CMM?							
0	15%	32%	33%	31%	<1%	<1%	<1%
1	11%	15%	13%	17%	8%	3%	12%
2	10%	12%	14%	11%	8%	10%	6%
3	10%	12%	9%	15%	9%	10%	8%
4	24%	15%	16%	13%	31%	29%	33%
5	30%	14%	15%	13%	43%	47%	39%
N	2,593	1,181	603	578	1,412	656	756
In the last two quarters, how many patients who were under care management and/or in transitions of care received CMM at your practice?							
None	3%	7%	9%	5%	<1%	<1%	1%
Some	63%	55%	53%	57%	68%	72%	64%
Most	28%	29%	29%	28%	27%	23%	31%
All	6%	9%	8%	10%	4%	5%	3%
N	2,203	804	403	401	1,399	650	749

Table 4.A.3.3 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
How does your practice deliver CMM?							
Coordination with an external pharmacist, program, or service NOT located at our practice	25%	20%	24%	15%	28%	26%	31%
Coordination with a pharmacist, program, or service located at our practice	37%	28%	25%	30%	43%	42%	43%
Primary care practitioners from our practice primarily deliver comprehensive medication management	38%	53%	51%	54%	29%	32%	26%
N	2,203	804	403	401	1,399	650	749

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

CMM = comprehensive medication management; SSP = Medicare Shared Savings Program.

Table 4.A.3.4. Comprehensiveness and coordination: Behavioral health integration, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
What is your practice's strategy for addressing behavioral health needs? If you have or planned to integrate one or two of the behavioral health models listed below, please select the option(s) that apply.							
We are not integrating behavioral health needs at our practice	1%	2%	3%	2%	<1%	<1%	<1%
BHI with Care Management for Mental Illness only	36%	47%	45%	49%	26%	25%	27%
BHI with Primary Care Behaviorist model only	57%	46%	48%	44%	67%	68%	66%
BHI with CMMI and PCB Hybrid	5%	5%	4%	5%	6%	6%	6%
N	2,593	1,181	603	578	1,412	656	756
Which of the following steps has your practice achieved to integrate behavioral health? (Select all that apply)							
BHI with Care Management for Mental Illness							
We have not taken any of these steps yet	<1%	<1%	0%	<1%	<1%	0%	<1%
Established a plan for identifying patients with behavioral health needs	89%	88%	91%	85%	91%	91%	90%
Identified and/or hired personnel	71%	70%	70%	70%	72%	67%	76%
Trained staff as necessary	84%	84%	83%	84%	85%	89%	82%
Developed workflows and processes	87%	86%	88%	84%	90%	92%	88%
Used measures to monitor and refine care management for patients with mental health disorders	39%	37%	41%	33%	41%	52%	33%
N	1,069	613	297	316	456	205	251
Which of the following steps has your practice achieved to integrate behavioral health? (Select all that apply.)							
BHI with the Primary Care Behaviorist Model							
We have not taken any of these steps yet	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Established a plan for identifying patients with behavioral health needs	94%	93%	95%	90%	95%	93%	97%
Identified and/or hired personnel	86%	76%	80%	72%	91%	90%	93%
Trained staff as necessary	84%	82%	85%	78%	86%	92%	81%
Developed workflows and processes	90%	88%	89%	87%	91%	87%	94%
Used measures to monitor and refine Primary Care Behaviorist model	53%	44%	49%	39%	58%	60%	56%
N	1,627	596	313	283	1,031	486	545

Table 4.A.3.4 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
How many of the above steps has your practice achieved to integrate behavioral health?							
BHI with Care Management for Mental Illness							
0	<1%	<1%	0%	<1%	<1%	0%	<1%
1	7%	9%	10%	9%	4%	1%	7%
2	7%	8%	6%	9%	7%	7%	7%
3	21%	17%	14%	20%	25%	30%	20%
4	37%	41%	39%	42%	31%	22%	39%
5	28%	25%	30%	20%	32%	39%	27%
N	1,069	613	297	316	456	205	251
How many of the above steps has your practice achieved to integrate behavioral health?							
BHI with the Primary Care Behaviorist Model							
0	<1%	<1%	<1%	<1%	<1%	<1%	<1%
1	5%	8%	6%	10%	3%	4%	2%
2	6%	8%	6%	11%	4%	3%	5%
3	13%	12%	10%	14%	13%	11%	15%
4	30%	36%	36%	35%	26%	27%	25%
5	47%	36%	41%	31%	53%	54%	52%
N	1,627	596	313	283	1,031	486	545
In the last two quarters, of your patients with identified behavioral health needs, estimate how many received behavioral health care management at your practice.							
None	1%	2%	2%	1%	1%	<1%	2%
Some	74%	75%	72%	78%	73%	68%	77%
Most	23%	21%	24%	18%	25%	31%	20%
All	2%	2%	2%	2%	<1%	0%	2%
N	1,069	613	297	316	456	205	251

Table 4.A.3.4 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
In the last two quarters, of your patients with identified behavioral health needs, estimate how many were seen by a primary care behaviorist at your practice.							
None	7%	9%	11%	7%	5%	7%	3%
Some	61%	59%	51%	67%	62%	56%	68%
Most	30%	29%	35%	23%	31%	36%	26%
All	2%	3%	3%	3%	2%	1%	3%
N	1,627	596	313	283	1,031	486	545
What mental health conditions are you targeting with your behavioral health strategy? (Select all that apply.)							
We do not target specific mental health conditions	4%	6%	8%	5%	2%	1%	2%
Anxiety disorders	82%	79%	76%	81%	85%	87%	83%
Alzheimer's disease and related dementias	29%	28%	26%	29%	31%	39%	24%
Depressive disorders	89%	87%	88%	86%	92%	94%	90%
Chronic pain	40%	36%	30%	42%	44%	52%	37%
Co-existing mental health and physical chronic conditions	62%	56%	58%	54%	66%	69%	64%
High-risk behaviors (e.g., tobacco use, obesity, medication adherence)	59%	60%	62%	57%	59%	66%	53%
Insomnia	34%	29%	27%	31%	39%	53%	27%
Substance use disorders (Select all that apply)	47%	37%	33%	41%	55%	66%	45%
Other	11%	12%	13%	11%	9%	8%	11%
Opioid	89%	87%	88%	86%	90%	90%	91%
Alcohol	92%	91%	88%	93%	93%	90%	97%
Tobacco	83%	85%	87%	84%	82%	86%	76%
Other	2%	3%	3%	2%	2%	2%	3%
N	2,556	1,152	584	568	1,404	653	751

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

BHI = behavioral health integration; SSP = Medicare Shared Savings Program.

Table 4.A.3.5. Comprehensiveness and coordination: Linkages with social services, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Do you routinely screen your patients for health-related social needs?							
We do not screen patients for health-related social needs	4%	9%	9%	9%	0%	0%	0%
We screen a targeted subpopulation of patients for health-related social needs	50%	47%	40%	54%	52%	52%	53%
We universally screen all patients for health-related social needs	46%	44%	51%	37%	48%	48%	47%
N	2,593	1,181	603	578	1,412	656	756
What type of screening tool(s) do you use or adopt to capture health-related social needs in your patient population? (Select all that apply.)							
We do not use any screening tools	1%	3%	3%	2%	<1%	0%	<1%
Standardized screening tool (e.g., screening tools published by HealthLeads, IOM/NAM, Accountable Health Communities [AHC])	43%	37%	40%	35%	47%	47%	48%
Tool developed by practice or system	58%	58%	59%	56%	59%	73%	46%
Other	15%	18%	19%	17%	13%	6%	20%
N	2,487	1,075	550	525	1,412	656	756
Are screening tools or questions integrated with your EHR or health IT system?							
No	12%	16%	13%	18%	9%	7%	10%
Yes	88%	84%	87%	82%	91%	93%	90%
N	2,455	1,045	532	513	1,410	656	754
What high priority health-related social needs has your practice identified in your patient population that you have connected to community resources for?							
We have not identified any high priority health-related social needs to address in our patient population	5%	11%	11%	12%	<1%	<1%	<1%
Food insecurity	79%	71%	71%	72%	86%	91%	82%
Housing instability	64%	57%	51%	64%	69%	73%	66%
Utility needs	59%	55%	55%	55%	63%	66%	61%
Financial resource strain	65%	57%	61%	53%	71%	78%	65%
Transportation	84%	79%	76%	81%	89%	88%	90%
Employment	31%	30%	32%	28%	32%	35%	29%
Social isolation	55%	49%	53%	46%	59%	65%	53%

Table 4.A.3.5 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Safety	69%	60%	57%	64%	77%	76%	78%
Other	15%	12%	12%	11%	17%	16%	18%
N	2,593	1,181	603	578	1,412	656	756
Do you have an established, ongoing relationship with social resources to address this need? - Food insecurity							
Yes	91%	87%	90%	83%	93%	97%	90%
No	9%	13%	10%	17%	7%	3%	10%
N	2,053	841	427	414	1,212	595	617
Do you have an established, ongoing relationship with social resources to address this need? - Housing instability							
Yes	87%	82%	89%	76%	90%	91%	90%
No	13%	18%	11%	24%	10%	9%	10%
N	1,659	679	310	369	980	480	500
Do you have an established, ongoing relationship with social resources to address this need? - Utility needs							
Yes	88%	85%	86%	85%	90%	93%	87%
No	12%	15%	14%	15%	10%	7%	13%
N	1,539	645	329	316	894	436	458
Do you have an established, ongoing relationship with social resources to address this need? - Financial resource strain							
Yes	85%	80%	80%	80%	88%	91%	84%
No	15%	20%	20%	20%	12%	9%	16%
N	1,675	673	365	308	1,002	514	488
Do you have an established, ongoing relationship with social resources to address this need? - Transportation							
Yes	90%	85%	87%	83%	93%	96%	91%
No	10%	15%	13%	17%	7%	4%	9%
N	2,182	929	458	471	1,253	576	677
Do you have an established, ongoing relationship with social resources to address this need? - Employment							
Yes	84%	78%	88%	65%	89%	90%	88%
No	16%	22%	12%	35%	11%	10%	12%
N	802	356	194	162	446	228	218
Do you have an established, ongoing relationship with social resources to address this need? - Social isolation							
Yes	86%	86%	89%	82%	87%	90%	84%
No	14%	14%	11%	18%	13%	10%	16%

Table 4.A.3.5 *(continued)*

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
N	1,414	584	318	266	830	427	403
Do you have an established, ongoing relationship with social resources to address this need? - Safety							
Yes	91%	88%	92%	85%	93%	96%	90%
No	9%	12%	8%	15%	7%	4%	10%
N	1,799	714	343	371	1,085	496	589
Do you have an established, ongoing relationship with social resources to address this need? - Other, please specify							
Yes	87%	73%	66%	80%	95%	98%	92%
No	13%	27%	34%	20%	5%	2%	8%
N	381	139	73	66	242	104	138
Do you have an inventory of social service resources integrated with your EHR or health IT system?							
No, we do not maintain an inventory of social services resources	2%	3%	1%	5%	<1%	<1%	<1%
No, we have an inventory of social service resources, but it is not integrated with our EHR or health IT system	64%	71%	71%	70%	59%	59%	59%
Yes, we have an inventory integrated with our EHR or health IT system	34%	26%	28%	25%	41%	41%	40%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

AHC = Accountable Health Community; EHR = electronic health record; IOM/NAM = Institute of Medicine/National Academy of Medicine; SSP = Medicare Shared Savings Program.

Table 4.A.3.6. Comprehensiveness and coordination: Comprehensiveness, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
As part of your practice's work to increase comprehensiveness, what is/are the complex need(s) your practice is developing capabilities to address? (Select all that apply.)							
We are not developing capabilities to increase comprehensiveness	3%	7%	6%	7%	<1%	<1%	<1%
End-of-life or palliative care	65%	58%	64%	51%	72%	83%	62%
Chronic pain	40%	43%	43%	44%	37%	42%	33%
Substance use disorders	36%	37%	35%	39%	36%	42%	30%
Co-existing chronic conditions	64%	63%	62%	65%	64%	72%	56%
High acuity chronic conditions, please specify	48%	43%	50%	37%	51%	48%	54%
Alzheimer's disease and related dementias	29%	26%	27%	26%	32%	34%	30%
Frailty	22%	23%	22%	24%	21%	25%	18%
Other	17%	19%	23%	14%	15%	15%	16%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.4.1. Patient and caregiver engagement: Engaging patients and caregivers in your practice, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Tell us how frequently your practice engages patients and caregivers in care and improvement activities							
Never	<1%	<1%	0%	<1%	<1%	<1%	<1%
Rarely	3%	3%	2%	4%	2%	1%	4%
Sometimes	45%	44%	43%	45%	47%	47%	46%
Often	39%	42%	42%	42%	37%	39%	36%
Always	12%	11%	13%	8%	14%	12%	15%
N	2,593	1,181	603	578	1,412	656	756
Which of the following steps has your practice achieved to implement and integrate the PFAC? (Select all that apply.)							
We have not taken any of these steps	1%	2%	1%	3%	<1%	<1%	<1%
Identified staff participants	97%	95%	97%	94%	98%	98%	97%
Recruited patient participants	97%	95%	97%	93%	98%	98%	97%
Defined mission and vision of PFAC	94%	92%	95%	90%	95%	95%	95%
Determined structure of the PFAC (e.g., number of patients or family advisors, frequency of meetings, term lengths, and other meeting logistics)	95%	93%	94%	91%	97%	98%	96%
Incorporated PFAC recommendations into practice	90%	85%	86%	85%	94%	95%	94%
Communicated PFAC recommendations to patients and staff	86%	81%	83%	79%	91%	90%	91%
Developed a sustainability plan for the PFAC	67%	66%	67%	64%	69%	69%	69%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

PFAC = Patient and Family Advisory Council; SSP = Medicare Shared Savings Program.

Table 4.A.4.2. Patient and caregiver engagement: Advance care planning, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Which of the following steps has your practice achieved to implement ACP? (Select all that apply.)							
We have not taken any of these steps yet	5%	11%	6%	16%	<1%	<1%	0%
Established a plan for identifying patients with ACP needs	82%	73%	78%	69%	90%	88%	92%
Identified personnel for ACP	78%	65%	70%	59%	88%	89%	87%
Trained staff as necessary	77%	67%	75%	58%	86%	83%	88%
Developed workflows and processes	73%	62%	69%	53%	83%	84%	82%
N	2,593	1,181	603	578	1,412	656	756
Count of the above steps your practice achieved to implement ACP							
0	5%	11%	6%	16%	<1%	<1%	0%
1	10%	16%	15%	17%	5%	4%	6%
2	12%	14%	12%	16%	11%	13%	10%
3	15%	15%	16%	14%	14%	16%	12%
4	58%	44%	51%	37%	69%	67%	71%
N	2,593	1,181	603	578	1,412	656	756
How does your practice identify patients for advance care planning? (Select all that apply.)							
We do not systematically identify patients for advance care planning	<1%	2%	2%	2%	<1%	<1%	<1%
High-risk status (using the practice's two-step risk stratification methodology)	48%	46%	48%	45%	50%	57%	43%
Patients with serious illness and/or based on age (e.g., cancer diagnosis, end-stage kidney disease, heart failure, COPD)	71%	66%	68%	64%	75%	79%	72%
Clinician or care team referral/identification	75%	76%	79%	73%	75%	79%	71%
Other	31%	30%	33%	28%	31%	27%	34%
N	2,462	1,054	569	485	1,408	652	756

Table 4.A.4.2 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
What system(s) do you use to document and store ACP conversations and decisions? (Select all that apply.)							
We do not document and store advance care planning conversations and decisions	<1%	<1%	<1%	0%	<1%	<1%	<1%
EHR or other health IT	99%	99%	99%	99%	100%	100%	99%
A local or regional Health Information Exchange	3%	3%	2%	4%	3%	2%	4%
Patient portal/patient health record	16%	20%	16%	24%	13%	10%	16%
Other	2%	2%	2%	2%	2%	2%	2%
N	2,462	1,054	569	485	1,408	652	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

ACP = advance care planning; EHR = electronic health record; SSP = Medicare Shared Savings Program; COPD = Chronic Obstructive Pulmonary Disease.

Table 4.A.5.1. Planned care and population health: Team-based care, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
How often do care teams at your practice have structured huddles focused on patient care?							
Never	<1%	<1%	1%	0%	<1%	0%	<1%
Only as needed or ad hoc	13%	19%	19%	19%	8%	5%	10%
At least daily	49%	45%	48%	42%	51%	46%	56%
At least weekly	29%	24%	19%	30%	33%	41%	26%
At least every 2 weeks	3%	3%	3%	3%	2%	2%	2%
At least monthly	7%	9%	10%	7%	5%	5%	5%
N	2,593	1,181	603	578	1,412	656	756
How often do care teams at your practice have scheduled care team meetings to discuss high-risk patients and planned care?							
Never	<1%	1%	1%	<1%	<1%	<1%	0%
Only as needed or ad hoc	30%	36%	31%	41%	24%	16%	32%
At least daily	12%	14%	18%	10%	10%	12%	8%
At least weekly	31%	21%	18%	23%	39%	44%	35%
At least every 2 weeks	5%	4%	5%	4%	6%	4%	8%
At least monthly	22%	24%	27%	21%	21%	24%	18%
N	2,593	1,181	603	578	1,412	656	756
How often do care teams at your practice meet and review quality improvement data (e.g., data on quality, cost, utilization, and patient experience of care)?							
Never	<1%	0%	0%	0%	<1%	<1%	0%
Only as needed or ad hoc	6%	9%	7%	11%	4%	2%	5%
At least weekly	15%	11%	6%	16%	18%	20%	17%
At least monthly	60%	58%	66%	49%	63%	64%	61%
At least quarterly	16%	18%	18%	19%	13%	13%	14%
At least annually	3%	4%	3%	5%	2%	1%	3%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.
SSP = Medicare Shared Savings Program.

Table 4.A.5.2. Planned care and population health: Use of data to plan care, Program Year 4, 2017 Starters

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Tell us what types of data on quality, utilization, patient experience, and other measures your practice regularly uses to improve delivery of care and achieve your CPC+ aims. (Select all that apply.)							
We do not use data in quality improvement work at our practice	<1%	<1%	<1%	<1%	<1%	0%	<1%
Electronic clinical quality measures (eCQMs)	98%	96%	95%	96%	99%	100%	99%
Claims data feedback from CMS (CPC+ data feedback tool)	87%	85%	85%	85%	89%	94%	85%
Claims data feedback from other payers	79%	77%	81%	73%	81%	84%	78%
Multi-payer data from Health Information Exchange (HIE), all payer claims databases (APCD), or other data aggregator	37%	41%	42%	40%	33%	37%	30%
Patient Reported Outcome Measures (PROMS)	28%	30%	35%	25%	26%	32%	20%
Patient experience data (e.g., CAHPS or other surveys)	93%	91%	93%	89%	94%	93%	94%
Performance-Based Incentive Report (PBIP)	63%	55%	35%	76%	69%	46%	90%
ACO/IPA/System analytics	54%	57%	82%	30%	52%	81%	27%
N	2,593	1,181	603	578	1,412	656	756
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Electronic clinical quality measures (eCQMs)							
1 – Not helpful at all	4%	2%	3%	1%	6%	9%	3%
2	3%	3%	4%	1%	2%	4%	1%
3	10%	10%	8%	13%	9%	11%	8%
4	26%	27%	28%	27%	25%	29%	22%
5 – Most helpful	57%	57%	57%	58%	57%	47%	66%
N	2,529	1,128	575	553	1,401	654	747
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Claims data feedback from CMS (CPC+ data feedback tool)							
1 – Not helpful at all	5%	6%	6%	5%	4%	4%	4%
2	19%	14%	12%	17%	23%	26%	21%
3	32%	33%	32%	34%	31%	26%	36%
4	27%	26%	23%	29%	28%	30%	26%
5 – Most helpful	17%	21%	27%	16%	14%	14%	14%
N	2,262	1,000	511	489	1,262	619	643

Table 4.A.5.2 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Claims data feedback from other payers							
1 – Not helpful at all	4%	3%	2%	4%	4%	1%	6%
2	11%	9%	5%	14%	13%	7%	17%
3	32%	34%	35%	33%	31%	26%	35%
4	33%	31%	32%	29%	35%	44%	26%
5 – Most helpful	20%	23%	26%	21%	18%	21%	15%
N	2,053	910	487	423	1,143	554	589
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Multi-payer data from Health Information Exchange (HIE)							
1 – Not helpful at all	11%	13%	15%	10%	8%	6%	10%
2	10%	12%	14%	10%	7%	2%	12%
3	25%	26%	33%	19%	23%	24%	22%
4	25%	26%	19%	33%	24%	19%	30%
5 – Most helpful	30%	22%	17%	27%	38%	49%	26%
N	951	482	252	230	469	242	227
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Patient Reported Outcome Measures (PROMS)							
1 – Not helpful at all	5%	4%	3%	4%	7%	8%	4%
2	14%	9%	8%	10%	19%	27%	7%
3	30%	39%	41%	38%	20%	20%	20%
4	25%	22%	18%	27%	28%	13%	50%
5 – Most helpful	27%	27%	30%	22%	26%	32%	19%
N	722	358	212	146	364	212	152
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Patient experience data (e.g., CAHPS or other surveys)							
1 – Not helpful at all	2%	2%	2%	3%	1%	<1%	2%
2	6%	4%	3%	6%	7%	4%	9%
3	24%	28%	29%	28%	21%	17%	25%
4	32%	31%	29%	34%	32%	31%	33%
5 – Most helpful	37%	34%	38%	30%	39%	47%	32%
N	2,403	1,076	560	516	1,327	613	714

Table 4.A.5.2 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - Performance-Based Incentive Report (PBIP)							
1 – Not helpful at all	10%	7%	14%	4%	13%	20%	10%
2	11%	9%	11%	8%	12%	6%	14%
3	32%	35%	19%	42%	30%	23%	33%
4	28%	29%	35%	27%	27%	39%	23%
5 – Most helpful	19%	20%	20%	19%	19%	12%	21%
N	1,632	651	212	439	981	301	680
How helpful is this data in quality improvement work at your practice? (Rate from 1-5, with 5 being the most helpful and 1 being not helpful at all) - ACO/IPA/System analytics							
1 – Not helpful at all	7%	7%	6%	13%	7%	8%	3%
2	4%	4%	5%	3%	4%	2%	10%
3	21%	23%	24%	20%	19%	22%	11%
4	34%	33%	33%	32%	35%	41%	17%
5 – Most helpful	34%	32%	32%	31%	36%	26%	59%
N	1,410	670	494	176	740	533	207

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

ACO = Accountable Care Organization; APCD = all-payer claims database; CAHPS = Consumer Assessment of Healthcare Providers and Systems; eCQM = electronic Clinical Quality Measure; IPA = Independent Physician Association; PBIP = Performance-based Incentive Payment; PROM = Patient-Reported Outcome Measure; SSP = Medicare Shared Savings Program.

Table 4.A.5.3. Planned care and population health: Continuous quality improvement, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Identify the quality measures on which your practice focused its quality improvement efforts during the past two quarters. (Select all that apply.)							
We have not focused quality improvement efforts on any of the quality measures below	0%	0%	0%	0%	0%	0%	0%
Required eCQMs							
Controlling High Blood Pressure	96%	95%	94%	95%	97%	98%	97%
Diabetes: Hemoglobin HbA1c Poor Control (> 9%)	99%	98%	99%	98%	99%	99%	99%
Other eCQMs							
Diabetes: Eye Exam	73%	69%	74%	63%	76%	81%	71%
Diabetes: Medical Attention for Nephropathy	55%	54%	50%	57%	56%	56%	57%
Dementia: Cognitive Assessment	25%	25%	22%	29%	25%	20%	30%
Depression Utilization of the PHQ-9 Tool	56%	62%	61%	64%	51%	53%	50%
Preventive Care and Screening: Screening for Depression and Follow-Up Plan	53%	54%	55%	53%	52%	52%	52%
Preventive Care and Screening: Tobacco Use Screening and Cessation Intervention	56%	57%	58%	55%	56%	64%	49%
Initiation and Engagement of Alcohol and Other Drug Dependence Treatment	12%	13%	9%	17%	10%	12%	9%
Falls: Screening for Future Falls Risk	59%	61%	66%	56%	58%	64%	53%
Breast Cancer Screening	81%	80%	86%	74%	82%	86%	79%
Cervical Cancer Screening	57%	55%	58%	52%	59%	66%	53%
Colorectal Cancer Screening	84%	83%	88%	77%	84%	90%	80%
Preventive Care and Screening: Influenza Immunization	60%	59%	60%	58%	61%	64%	58%
Pneumococcal Vaccination Status for Older Adults	51%	51%	53%	49%	51%	54%	49%
Ischemic Vascular Disease (IVD): Use of Aspirin or Another Antiplatelet	16%	18%	18%	17%	15%	15%	14%
Statin Therapy for the Prevention and Treatment of Cardiovascular Disease	40%	45%	50%	40%	35%	33%	37%
Closing the Referral Loop: Receipt of Specialist Report	35%	38%	38%	37%	32%	31%	34%
Use of High-Risk Medications in the Elderly	19%	21%	20%	22%	17%	14%	20%
Other	8%	9%	9%	8%	7%	11%	4%

Table 4.A.5.3 *(continued)*

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Utilization and cost							
ED	92%	91%	90%	93%	92%	93%	91%
Inpatient	86%	86%	87%	86%	86%	89%	84%
Specialty care	23%	25%	33%	17%	21%	23%	20%
Imaging/labs	21%	22%	29%	15%	20%	20%	20%
Post-acute care	28%	25%	33%	17%	30%	35%	26%
Observation stays	17%	18%	19%	17%	16%	13%	18%
Other	9%	8%	8%	7%	11%	17%	5%
Patient experience (CAHPS domains)							
Getting timely appointments, care, and information	82%	79%	82%	75%	85%	88%	84%
How well practitioners communicate with patients	58%	56%	61%	52%	60%	63%	58%
Overall practitioner ratings	60%	60%	63%	57%	60%	64%	57%
Attention to care from other practitioners	29%	28%	30%	25%	31%	28%	32%
Practitioners support patients in taking care of own health	41%	39%	42%	37%	42%	41%	44%
Other	9%	8%	5%	10%	10%	10%	10%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

CAHPS = Consumer Assessment of Healthcare Providers and Systems; eCQM = electronic Clinical Quality Measure; SSP = Medicare Shared Savings Program.

Table 4.A.5.4. Planned care and population health: Culture of improvement at your practice, Program Year 4, 2017 Starters

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Over the last two quarters, who in your practice primarily generated improvement ideas and opportunities?							
Did not occur	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Clinical and administrative leadership	89%	87%	93%	81%	91%	90%	92%
Designated quality improvement team	60%	59%	67%	51%	61%	66%	57%
Care teams and clinical staff	76%	75%	76%	74%	78%	86%	70%
Non-clinical staff	47%	48%	51%	46%	46%	46%	45%
Patients/caregivers	44%	48%	47%	49%	42%	42%	41%
N	2,593	1,181	603	578	1,412	656	756
Over the last two quarters, who in your practice implemented improvement projects or tests of change?							
Did not occur	1%	2%	3%	1%	<1%	<1%	1%
Clinical and administrative leadership	80%	78%	81%	75%	81%	75%	86%
Patients/caregivers	11%	10%	10%	10%	11%	7%	14%
Non-clinical staff	48%	47%	47%	46%	50%	57%	44%
Care teams and clinical staff	80%	77%	78%	77%	82%	85%	78%
Designated quality improvement team	58%	56%	63%	49%	59%	63%	56%
N	2,593	1,181	603	578	1,412	656	756
Over the last two quarters, who in your practice had access to practice-level results?							
Did not occur	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Designated quality improvement team	67%	62%	68%	55%	72%	82%	62%
N	2,593	1,181	603	578	1,412	656	756
Over the last two quarters, who in your practice had access to practice-level results?							
Clinical and administrative leadership	95%	93%	95%	91%	96%	96%	96%
Care teams and clinical staff	87%	84%	85%	83%	90%	93%	87%
Non-clinical staff	59%	55%	59%	51%	62%	67%	58%
Patients/caregivers	16%	17%	14%	19%	15%	12%	17%
N	2,593	1,181	603	578	1,412	656	756
Over the last two quarters, who in your practice had access to results identified to the applicable practitioner or care team?							
Did not occur	1%	2%	2%	1%	1%	<1%	1%
Non-clinical staff	45%	44%	47%	40%	47%	52%	41%
Care teams and clinical staff	80%	79%	80%	78%	81%	84%	79%
Designated quality improvement team	63%	57%	63%	51%	69%	79%	60%
Clinical and administrative leadership	94%	92%	95%	89%	95%	96%	94%
Patients/caregivers	7%	9%	8%	9%	5%	5%	6%
N	2,593	1,181	603	578	1,412	656	756

Source: Mathematica's analysis of 2020 (Quarter 4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

4.B. Methods Used for the Deep-Dive Practice Study

In this Appendix, we describe changes to our data collection strategy and the number of practices interviewed over the course of the deep-dive practice study. First, we summarize the approach used in program years (PYs) 1 and 2. Then we detail the interview guide, sample of practices, and analytic methods used in PY 4. As planned, we did not collect qualitative data for the deep-dive practice study in PY 3. More details on the deep-dive data collection methods used in PYs 1 and 2 are in the appendices to the evaluation's first and second annual reports (Anglin et al. 2019 and Ghosh et al. 2020).

In PYs 1, 2, and 4, the sample of CPC+ practices chosen for the evaluation's deep-dive practice study were similar to all of the CPC+ practices that started in 2017, in four key characteristics: (1) CPC+ track, (2) participation in the Medicare Shared Savings (SSP) program, (3) ownership status, and (4) size (the number of primary care practitioners at the practice site).

4.B.1. Overview of deep-dive data collection in PYs 1 and 2

In PY 1, we identified 81 practices that joined CPC+ in 2017 to participate in the evaluation's deep-dive practice study. To learn about practices' experiences with CPC+ in PY 1, we conducted deep-dive data collection by interviewing staff in person at the 81 practices in spring 2018. We used one interview guide that included 10 topic-focused modules: 1 for each of the five CPC+ functions, 1 on payment, 1 on learning supports, 1 on health care systems' perspectives on CPC+, and 1 each on the special topics of use of specialists and teamwork. Because of the length of the overall interview guide and to ensure that we collected comprehensive and in-depth data about practices' experiences with multiple aspects of CPC+, we administered 3 or 4 of the 10 modules to each deep-dive practice, enabling us to gather detailed information for each module from about 30 diverse practices.

To learn about practices' experiences with CPC+ in PY 2, we conducted deep-dive data collection as telephone interviews with staff from 59 of the 81 practices interviewed in PY 1 in spring 2019. We reduced the sample from 81 to 59 practices, because (1) in the analysis of the PY 1 interviews, we reached saturation and identified key findings before analyzing the full sample of 81 practices; (2) we wished to reduce data collection burden on practices when a smaller sample was sufficient; and (3) we wished to reduce evaluation costs and maximize efficiency. We used one interview guide that included eight topic-focused modules. The eight modules included one for each of the five CPC+ functions, one on payment, one on learning supports, and one on health care systems' perspectives on CPC+. Instead of creating additional special-topics modules, we added questions on two special topics to two of the eight modules. The special topics included in the PY 2 interview guide were practices' development and use of care plans and practices' experiences with continuous quality improvement. We administered two or three of the eight modules to each deep-dive practice, enabling us to gather detailed information for each module from about 22 diverse practices.

4.B.2. Deep-dive data collection in PY 4

In PY 4, we made two key changes to the PY 2 deep-dive study data collection strategy: (1) we used the complete interview guide with all practices (rather than assigning interview guide modules to subsets of practices), and (2) we interviewed fewer practices (40 of the 59 interviewed in PY 2). Our analysis process remained largely the same as in PYs 1 and 2. In the sections below, we describe the interview guide, sample reduction, and analysis processes used in PY 4.

A. Interview guide for deep-dive telephone interviews

To learn about practices' experiences with CPC+ in PY 4, we used one interview guide with all practices (rather than assigning interview guide modules to subsets of practices as we had in PYs 1 and 2). We opted for this approach because (1) CMS reduced the number of care delivery requirements from 21 to 13 between PYs 2 and 3, so we had fewer requirements to cover during interviews, and (2) we wanted to ask all practices in-depth questions about the care delivery requirements we had observed to be particularly challenging for practices to implement in prior years.

The interview guide we used in spring 2021 to conduct telephone interviews with all deep-dive practices covered the following topics: alternatives to traditional office visits, risk stratification, longitudinal care management, episodic care management, coordination with specialty care, behavioral health integration, comprehensive medication management, health-related social needs, advance care planning, planned care and population health, the coronavirus disease 2019 pandemic, teamwork, CPC+ learning supports, and experiences with CPC+ overall.

B. Selection of deep-dive practices

In PY 4, we reduced the sample of deep-dive practices to 40 of the 59 interviewed in PY 2. Based on our experiences in PYs 1 and 2, and because we planned to ask all practices all of the questions in the interview guide, we expected to reach saturation of themes with 40 practices.

As in previous years, the 40 practices were chosen to be similar to all CPC+ practices in terms of CPC+ track, SSP participation, ownership, and size (Table 4.B.1). The sample of 40 practices came from 13 of the 14 regions that started CPC+ in 2017, and was proportional to the total number of participating practices in each region, as follows:

- Three to six practices from each of the three regions with the largest number of participating practices (Michigan, New Jersey, and Ohio & Northern Kentucky)
- Two to five practices from each of the eight medium-sized regions (Arkansas, Colorado, Greater Kansas City, Greater Philadelphia, Hawaii, North Hudson-Capital, Oklahoma, and Oregon)
- One to two practices from two of the regions with the smallest number of participating practices (Montana and Rhode Island)

We did not include practices from one of the regions with the smallest number of participating practices (Tennessee), because only large (mostly system-owned) practices were participating in CPC+ at the time of sample selection, and we prioritized recruitment of small independent practices across regions to ensure our sample was balanced on these characteristics.

Five of the original 40 deep-dive practices declined to participate in interviews. We replaced them with alternate practices with similar characteristics selected from the 59 practices in the PY 2 sample.

Table 4.B.1. Characteristics of deep-dive practices and all CPC+ practices that started in 2017 and were interviewed about PY 4 experiences

Practice characteristic	Deep-dive practices (N = 40)	All practices (N = 2,599)
Track 1	45%	46%
Track 2	55%	54%
Participated in CPC Classic	10%	16%
SSP	40%	49%
System or group affiliation	77%	74%
Practice size (number of primary care practitioners)		
Small (1–2)	20%	27%
Medium (3–5)	35%	39%
Large (6+)	40%	34%

Source: We measured the time-varying practice characteristics of practice size and SSP participation status at the end of PY 3 to capture practices' characteristics at the start of PY 4. We measured practice system or group affiliation as reported in each practice's CPC+ application before CPC+ began. We also measured participation in CPC Classic before CPC+ began, because it cannot change during CPC+. The data are derived from Mathematica's analysis of (1) CMS's CPC+ practice tracking data for number of primary care practitioners (as of December 2019), SSP participation status (as of January 2020), and system or group affiliation (as of November 2016), and (2) data from CMS on CPC Classic participation.

Notes: N = 2,599 CPC+ practices (1,185 Track 1 practices and 1,414 Track 2 practices) that were participating at the end of PY 4.

The percentages in this table for all CPC+ practices are largely similar to the percentages shown in Chapter 2. In Chapter 2, Figure 2.7, however, "system" includes only practices that are owned by a hospital or health system, whereas for the deep-dive sample, "system or group" practices include those that are part of *any* larger health care organization, including group practices.

PY = program year; SSP = Medicare Shared Savings program

C. Analysis of deep-dive interview data

We transcribed all interview recordings. A team of trained researchers used the interview transcripts to code and analyze the interview data. To organize data for analysis, we used codes aligned with the topics covered in the interview guide. We also used the Consolidated Framework for Implementation Research to code factors that practices described as barriers or facilitators to CPC+ implementation, such as a practice's internal quality improvement resources or the presence of other primary care initiatives (Damschroder et al. 2009). We used NVivo software to code and organize the data for cross-practice analysis.

4.C. Study of exemplar practices

This Appendix describes findings from a mixed-methods study with exemplar CPC+ practices. We used Bayesian analyses to identify CPC+ practice sites with the highest probability of achieving substantial reductions in the Medicare Acute Hospitalization Rate (AHR) between 2016 (the year preceding CPC+) and 2018 (the second year of CPC+). We then conducted telephone interviews and within- and cross-case comparative analysis of 14 of these primary care practice sites (hereafter referred to as "exemplars"). The Appendix is organized into introduction (Section 1), methods (Section 2), results (Section 3), and discussion (Section 4). Section 5 provides additional, technical details on our approach for identifying exemplar practices.

4.C.1. Introduction

Substantial evidence demonstrates many acute hospitalizations in the United States could be avoided by providing patients with timely access to high-quality primary care (Bindman et al. 1995; Starfield 1998; Rosano et al. 2013; Rich et al. 2021a; Brown et al. 2012; Wasson et al. 1984). Yet many primary care practices and primary care practitioners (PCPs) may not be able to achieve this goal. Beset by increasing patient complexity and administrative burdens, PCPs also face fee-for-service (FFS) payments insufficient to support their efforts to deliver high-quality care that is accessible, continuous, coordinated, and comprehensive (Østbye et al. 2005; Berenson and Rich 2010; Starfield 1992; NAM 2021).

To help address such challenges, in January 2017, the Centers for Medicare & Medicaid Services launched CPC+ (Peikes et al. 2019). More than 3,000 primary care practice sites participate in CPC+. CPC+ gives sites financial resources and technical assistance and promotes regionally based payment reform and primary care transformation to improve quality of care and achieve better health outcomes at lower cost (Sessums et al. 2016; CMS 2021a).

Since hospital spending accounts for 41 percent of annual Medicare Part A and B costs, even a modest reduction in the AHR could yield savings (MedPAC 2021). However, there is little evidence identifying effective strategies for reducing avoidable hospitalizations across diverse primary care practice settings and patient populations. Therefore, as part of the CPC+ independent evaluation, we sought to understand how practices that succeeded in reducing AHR did so.

4.C.2. Methods

We used Bayesian analyses to identify the CPC+ practice sites—the single physical locations where patients are served—with the highest probability of achieving substantial reductions in Medicare AHR over time. We then conducted telephone interviews and within- and cross-case comparative analysis of 14 of these primary care practice sites (hereafter referred to as "exemplars").

A. Exemplar identification

We defined the AHR as the number of hospitalizations at short-stay acute hospitals and critical access hospitals per 1,000 Medicare beneficiaries per year. This AHR measure included

emergency department (ED) visits and observation stays if they resulted in an inpatient admission; we excluded hospitalizations for elective surgery and planned procedures. We used Medicare claims and enrollment data and Bayesian modeling to estimate the probability that each CPC+ practice site achieved a substantial reduction (at least 5 percent larger than the average CPC+ practice site) in AHR, adjusted for a range of patient, practice, and market characteristics. Using this methodology, we identified the 25 primary care practice sites, of the 2,888 that joined CPC+ in 2017, with the highest probability of achieving substantial reductions in their AHR between 2016 (the year preceding CPC+) and 2018 (the second year of CPC+ participation). (See details in Section 4.C.5.)

B. Interviews with exemplars

We conducted an initial 60-minute interview with one or two practice and system leaders at each exemplar. We used a grounded theory approach, asking the same open-ended questions in each interview to identify the factors (care delivery activities, practice characteristics, and community context) respondents perceived as influencing AHR reductions (Table 4.C.1) (Strauss and Corbin 190). We then conducted 60-minute follow-up interviews with two to eight staff individually at 9 of the 14 exemplars to gather detail. We customized these interviews based on findings from the initial interview and the respondent's role at the practice. Five exemplars declined to participate in the follow-up interviews.

Health services researchers conducted all interviews for their assigned exemplars, each paired with a physician with primary care research experience. We acquired verbal consent, and recorded and transcribed the interviews.

Table 4.C.1. Key interview questions

Opening questions	Probes for each factor identified
• In your opinion, what are the one or two things that pop into your mind as the most important factors going on at, or outside, this practice that might explain reductions in acute hospitalizations among your patients between 2016 and 2018? • Was there anything else significant that was new or different about **how this practice delivered care** that might account for reductions in acute hospitalizations among its patient population from 2016 to 2018? • Was there anything else significant that was new or different about **the characteristics of this practice** that might account for reductions in acute hospitalizations among its patient population from 2016 to 2018? • Was there anything else significant that was new or different **about the community or region outside of this practice** that might account for reductions in acute hospitalizations among its patient population from 2016 to 2018?	• When did you start doing or experiencing it? • Has anything about it changed since that time? If so, tell me more. • How did the practice implement [this factor]?

C. Qualitative analysis

Within- and cross-case analysis proceeded in stages (Yin 2009; Stake 1995). After completing interviews, we drafted a case report for each exemplar based on interview notes. We then coded interview transcripts using NVivo 12 (QSR International), using codes aligned with interview questions and open coding to capture factors influencing AHR. We met weekly to resolve coding discrepancies and revise codes. We used coded data to finalize case reports. We then scored the

influence of factors present in each report from 0 (not contributing to AHR reduction) to 3 (major contributor to AHR reduction). Scoring took into consideration respondents' perceptions, when the factor was introduced or modified, and the proportion of patients that it potentially influenced. We reviewed each case report and independently scored factors. We held a series of meetings to finalize scores through consensus discussions (Belgrave and Smith 1995). We entered scores and substantiating data into a matrix with exemplars as columns and factors as rows.

We then used the matrix to detect similarities and differences across the cases, merge and distinguish concepts, identify factors present for four or more cases, and generate findings (Glaser and Strauss 1967). We met weekly to reach consensus on factors and referred back to transcripts and coded data as needed. To check that variation in the number of interviews conducted across exemplars did not bias results, we compared results from the 11 cases with multiple interviews to the results from the 5 cases with a single interview. Factors present at the 5 practices were represented in the sample of 11, though fewer factors emerged overall for the cases with less data.

After the analysis was complete, we conducted 3 virtual panels with 17 staff from 12 exemplars to confirm that our findings aligned with their perceptions and to discuss implications.

The New England Institutional Review Board (IRB) granted the study an IRB exemption.

4.C.3. Results

From February to December 2020, we conducted telephone interviews with 14 of the 25 practice sites; 11 sites declined to participate or did not respond to outreach. The coronavirus-19 pandemic likely contributed to our sample being smaller than planned; although recruitment was paused during the initial surge in cases, once we resumed, many practices declined to participate. Nonparticipating practice sites were more likely to serve fewer Medicare beneficiaries and have less prior experience with medical home models than those that participated. We interviewed 64 respondents:19 physicians, 14 practice administrators, 11 system-level leaders, 10 care managers, and 10 other practice staff (e.g., nurses and physician assistants).

The 14 exemplars experienced a 6 percent average *decrease* in Medicare AHR between 2016 and 2018, in contrast to an average *increase* of 5 percent in non-exemplar CPC+ practices. Table 4.C.2 displays select characteristics for each participating exemplar. Consistent with purposively selecting practices with the largest reductions in AHR, our sample differs from the full set of CPC+ practices. We did not conduct tests of statistical significance comparing the exemplar and full CPC+ samples, though some notable differences exist (Table 4.C.3). The 14 participating exemplars were larger, employed more practitioners, and served more FFS beneficiaries than did CPC+ practices overall and thus received larger CPC+ payments. All 14 exemplars had primary care transformation experience. Exemplars also served patients with slightly higher medical complexity. Exemplars were more likely to be located in rural areas and in the western United States. Exemplars were in counties with more acute care hospital beds than CPC+ practices overall.

Table 4.C.2. Select characteristics of each exemplar at baseline, 2016

Exemplar	Change in AHR [a]	Probability of improvement in AHR	Hospital/ system owned	Size (# of PCPs)	Mean number of beneficiaries [b]	Prior transformation experience [c]	County type	State
E1	-11%	99%	Yes	3-5	798	Yes	Urban	KY
E2	-9%	99%	Yes	6+	2,674	Yes	Urban	MO
E3	-6%	91%	Yes	6+	2,991	Yes	Urban	CO
E4	-6%	91%	Yes	6+	2,206	Yes	Urban	PA
E5	-5%	87%	Yes	6+	2,540	Yes	Rural	MT
E6	-6%	86%	Yes	6+	889	Yes	Urban	CO
E7	-6%	83%	No	3-5	831	Yes	Urban	NJ
E8	-5%	83%	No	3-5	1,028	Yes	Suburban	MI
E9	-5%	83%	No	3-5	929	Yes	Rural	AR
E10	-5%	82%	Yes	6+	1,802	Yes	Urban	OR
E11	-5%	77%	No	6+	574	Yes	Urban	OH
E12	-4%	77%	No	6+	1,090	Yes	Urban	RI
E13	-4%	76%	No	6+	1,256	Yes	Urban	OH
E14	-4%	75%	Yes	6+	1,055	Yes	Rural	CO

Sources: Mathematica's analysis of data on the number, characteristics, and service use and spending of attributed Medicare beneficiaries based on Medicare Enrollment Database and claims data. Mathematica's analysis of data on practice size and ownership from SK&A Office-based Provider Database data; data on the number of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data; data on participation in the Centers for Medicare & Medicaid Services' (CMS's) Multi-payer Advanced Primary Care Practice (MAPCP) and Comprehensive Primary Care Classic (CPC Classic); county data from the Area Resource File.

AHR = acute hospitalization rate; PCP = primary care practitioner.

[a] Change in AHR is risk-adjusted and de-noised percentage changes from 2016 to 2018 (see details in Section 4.C.5.).

[b] Mean number of attributed Medicare fee-for-service beneficiaries in 2016.

[c] Prior transformation experience includes patient-centered medical home (PCMH) recognition, MAPCP, or CPC Classic. A practice was considered to have PCMH recognition if ≥1 of its primary care practitioners had recognition at some point in 2014–2017 from the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Committee for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC). We considered a practice to be an MAPCP participant if it participated in any year from 2011 to 2014, as determined by a file from CMS. Participants include practices that stayed enrolled in CPC Classic for at least the first five months.

Table 4.C.3. Comparison of the exemplars to all CPC+ practices at baseline, 2016

Characteristic	All CPC+ practices (n = 2,888) value	Exemplars (n = 14) value
Practice site characteristics[a]		
Practice size, %[b]		
1–2 primary care practitioners	34	0
3–5 primary care practitioners	38	29
6 or more primary care practitioners	28	71
Number of attributed Medicare fee-for-service beneficiaries in 2018, mean[b]	710	1,683
Prior primary care transformation experience (PCMH[c] recognition, MAPCP[d] or CPC Classic)[e], %	61	100
Hospital/system owned (vs. independent), %	55	57
Enhanced CPC+ (Medicare and payer partner) payments per NPI in 2018, median (SE)	$42,964 ($41,043)	$47,559 ($43,865)
Beneficiary characteristics[f]		
Age, %		
<65	16	17
65–74	47	46
75–84	26	26
85+	12	11
Female, %	59	58
HCC score, mean (SE)[g]	1.08 (0.17)	1.14 (0.08)
Dually eligible for Medicare and Medicaid, %	15	16
Original reason for Medicare enrollment, %		
Age	78	76
Disability	22	23
End-stage renal disease	1	1
Race/ethnicity, %		
Black	7	8
White	86	87
Hispanic	1	1
Not White, Black, or Hispanic	6	4
Market characteristics		
Household income in county in which practice is located ($), median (SE)	$54,208 ($15,054)	$53,164 ($16,222)
Location, %		
Rural	9	21
Suburban	15	7
Urban	76	71
Region, %		
Northeast	29	21
Midwest	35	29
South	18	14
West	18	36
Number of acute care hospital beds per 1,000 population in the county in which practice is located, %		
1st quartile	26	21
2nd quartile	26	14
3rd quartile	26	50
4th quartile	22	14

Sources: Mathematica's analysis of data on the number, characteristics, and service use and spending of attributed Medicare beneficiaries based on Medicare Enrollment Database and claims data. Mathematica's analysis of data on practice size and ownership from SK&A Office-based Provider Database data; data on the

Table 4.C.3 *(continued)*

number of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data; data on participation in MAPCP and CPC Classic; county data from the Area Resource File.

Note: Percentages do not always add to 100 because of rounding.

[a] Exemplars did not differ from the CPC+ practices overall in their Medicare Shared Savings Program status or track for the CPC+ model.

[b] A change in acute hospitalization rate in smaller practices could be due to chance from small sample sizes, rather than real change. Therefore, very small practices tended not to be identified as exemplars because the Bayesian model could not achieve a high level of confidence of a real change based on a small number of attributed Medicare FFS beneficiaries.

[c] A practice was considered to have PCMH recognition if ≥1 of its primary care practitioners had recognition at some point in 2014-2017 from a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Committee for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC).

[d] We considered a practice to be an MAPCP participant if it participated in any year from 2011 to 2014, as determined by a file from CMS.

[e] Participants include practices that stayed enrolled in CPC Classic for at least the first 5 months.

[f] Characteristics apply to Medicare fee-for-service beneficiaries attributed to practices in 2016.

[g] The Hierarchical Condition Category (HCC) score is based on beneficiaries' diagnoses in 2015.

CPC = Comprehensive Primary Care; FFS = fee-for-service; HCC = Hierarchical Condition Category; MAPCP = Multi-payer Advanced Primary Care Practice; NPI = National Provider Identifier; PCP = primary care practitioner; PCMH = patient-centered medical home; SE = standard error.

A. Factors that exemplars perceived as reducing their AHR

Our analysis of factors revealed eight care delivery activities that respondents perceived as reducing their AHR between 2016 and 2018. The activities align with three overarching strategies: (1) improve access to primary care, (2) expand care management, and (3) increase comprehensiveness of care. Respondents perceived each strategy to increase their practice's capacity to meet patients' needs in a timely fashion, providing an alternative to ED or hospital care. Each exemplar used a combination of activities within and across strategies and attributed varying levels of influence to each activity on their AHR. Table 4.C.4 shows the prevalence of activities within strategies across exemplars. We discuss findings for the three AHR reduction strategies below.

Table 4.C.4. Prevalence and perceived level of contribution of activities (within strategies) to reduce acute hospitalizations within and across exemplars

Activities within strategies	Perceived levels of contribution, by exemplar (E)													
	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14
Improve access to primary care														
Same day visits	2	0	0	0	3	0	2	0	3	1	3	0	2	2
Direct access by telephone	2	1	0	0	0	0	0	0	1	0	0	0	0	2
Urgent care sites (system-run)	3	0	0	0	1	3	0	0	0	0	1	0	1	0
Expand care management														
Follow-up after hospitalization/ ED visits	2	2	2	2	0	3	3	3	1	1	1	2	0	2
Long-term care management	1	0	2	2	2	1	2	0	2	2	0	2	0	3
Specialized programs	0	2	0	3	0	0	0	1	2	0	0	2	0	0
Increase comprehensiveness of care														
Breadth of services at practice	1	1	2	1	1	2	1	0	0	3	0	1	0	1
Breadth and depth of care provided by PCP	0	2	1	1	1	1	0	0	2	0	0	2	0	0

Note: Level of contribution: ○ = 0, not identified by respondents as a significant factor for reducing their acute hospitalization rate (AHR); ◔ = 1, perceived as a minor contributing factor to reduced AHR; ◕ = 2, perceived as a moderate contributing factor to reduced AHR; ● = 3, perceived as a major contributing factor to reduced AHR.

E= Exemplar; ED = emergency department; PCP = primary care practitioner.

AHR reduction strategy 1: Improve access to primary care

Exemplars reported improving access to primary care in a variety of ways to increase the likelihood of addressing patients' concerns quickly. As one care manager said, "More frequent and appropriate use of the acute [primary] care system prevents hospitalizations, and that's what we are doing with same-day availability. Get 'em in and get them assessed before they seek ED care or put off care that could result in an acute admission."

Many exemplars said they increased the number of same-day visits, encouraging patients to see a PCP for urgent needs or concerns (thereby avoiding ED visits). Exemplars that hired staff to provide same-day visits (either nurse practitioners who explicitly focused on same-day visits or PCPs who did not yet have full patient panels) were able to expand access to more patients than exemplars that added same-day slots to existing practitioners' schedules.

A few exemplars increased timely telephone access to the practice by providing high-risk patients with the phone number of a care manager. They noted that by being familiar with the patient, care managers could readily address patient needs or consult with the patient's PCP.

Some health system-affiliated exemplars perceived their AHR improvements were achieved through new system-owned urgent care centers providing patients an alternative to the ED when PCPs were not readily available. They noted that these system-affiliated centers had access to patients' information and could contact PCPs to schedule primary care follow-up appointments through shared health information technology, unlike independently operated urgent care centers.

Exemplars proactively promoted the use of primary care (through verbal and written communication, posters, and portal messages) as an alternative to the ED for managing new or worsening concerns.

AHR reduction strategy 2: Expand care management

Most exemplars credited the expansion of care management with helping to reduce AHR. By identifying patients at high risk for ED or hospital use and addressing patient needs with focused outreach to supplement traditional PCP visits, exemplars perceived they were able to avert hospitalizations by intervening earlier in the course of illness.

Most exemplars followed up with patients within 48 hours of a hospital discharge to provide information and linkages to primary care to prevent additional hospitalizations. Exemplars called patients to check on their health; review medications; answer questions; provide disease-specific education; connect them to needed supports (e.g., medical equipment, social services); and schedule follow-up appointments with the PCP. Exemplars instituted or expanded these efforts during the first two years of CPC+ by hiring or redeploying staff to this role. Many exemplars extended these efforts to patients who visited the ED or experienced observation stays. Various exemplars perceived that follow-up calls were most effective when made by care managers who had specific skills (e.g., background in nursing or social work, ability to build rapport, empathy) and who used purposeful processes (e.g., reviewing discharge reports to prepare for calls, asking questions and following through to ensure patients' needs were met)—in contrast to automated calls or calls by less skilled staff focused on scheduling follow-up appointments. As a system leader shared, follow-up calls were especially effective when care managers making the calls were connected to a care team: "The care manager was vital, but she would not have been as successful without the team that she fit into and benefited from. So it's not just a person, it's a process and a program." Receipt of complete and timely information from discharging facilities, and, in a few cases, the discharging hospital scheduling the patients' follow-up appointments with their PCP, enabled exemplars' work.

Many exemplars credited long-term care management as contributing to improvements in AHR. Although strategies varied across exemplars, long-term care management consistently involved continuous relationship-based support outside of PCP visits that was matched to patients' needs, conditions, and abilities. Exemplars added staff to provide these services to additional patients at the practice site. They noted that care managers were most effective when they knew how to prioritize patients, were skilled problem solvers, and could build trust with patients and PCPs. To enroll the patients at highest risk of hospitalization, several exemplars used enhanced risk score algorithms and/or developed capabilities to detect frequent users of the hospital and ED.

Several exemplars developed specialized care management programs at their primary care site, targeting subgroups of patients based on condition prevalence in their population, as well as available practice resources, and likely intervention effectiveness. For example, one exemplar

monitored the frequency of albuterol refills among patients with chronic obstructive pulmonary disease (COPD) as an early indicator of higher risk of COPD exacerbation. Another exemplar developed an outpatient program to better manage care of people living with sickle cell disease, which reduced admissions for complications of the disease.

AHR reduction strategy 3: Increase comprehensiveness of care

Many exemplars perceived that increasing the comprehensiveness of care helped reduce AHR by better managing new conditions and preventing exacerbations of patients' chronic conditions.

These exemplars expanded the breadth of services offered at the practice site to treat patients' range of needs. Examples of new or enhanced services included behavioral health, social work, and medication management. As one PCP described the influence of broadening the practice's capabilities on AHR: "It's all together. It's everybody, truly all-hands-on-deck wrapping ourselves around; we all bring something to the table that's different. It's synergistic."

Several exemplars described using team-based care to allow PCPs to spend more time with challenging patients to better understand their needs and assess their health concerns, increasing the breadth and depth of care provided. To accomplish this, one exemplar employed advanced practice clinicians to manage patients with straightforward issues so physicians could reserve time for those with more complex health conditions. Other exemplars shifted staff roles to help PCPs be more comprehensive; for example, medical assistants took on advanced activities such as reviewing medications, identifying gaps in care, and working as scribes. As one PCP said, "I felt freed up to do things I really wanted to do, as a doctor, to actually talk to my patients and have them take care of their health. Shifting the non-provider work to non-providers allowed us extra time to do these provider things we really wanted to do."

B. Facilitators of AHR reduction strategies

Our analysis also identified practice characteristics that facilitated exemplars' ability to implement the three AHR reduction strategies. Despite probing respondents about factors external to the practice that might have helped them reduce AHR, none emerged as a finding in the cross-case analysis. Table 4.C.5 describes four facilitators that were present across all or most exemplars.

Table 4.C.5. Facilitators of exemplars' efforts to prevent acute hospitalizations

Facilitator	How facilitator supported care delivery activities within strategies	Illustrative quote
Experience and investment in practice transformation	Provided practices necessary payment structure, incentives, resources, and capabilities to track AHR. Offered learning supports that helped practices use data and adopt new workflows.	"CPC+ was the first time we were responsible for total cost of care... that we, as a practice, were financially connected to the hospitalization rate. We weren't measuring that at the practice level [before CPC+]. Once we had a financial connection and mechanism to track that, we completely changed our workflows." –PCP
Use of data from CPC+, other payers, health systems, and electronic health record enhancements	Enabled practices to monitor high-risk patients, intervene early in their care, and link to helpful resources Improved PCPs' ability to make point-of-care decisions.	"All of a sudden, we were given lists that say, 'These are your 10% of patients who are hospitalized the most or have the most ED follow up, the most chronic disease.' By identifying these patients, we were able to link them to our new ancillary services [within the primary care practice site] and really tackle the reasons that they're not doing well." –PCP
Implementing or enhancing primary care teams through team-based care models	Allowed staff to work at the top of their license and cover for each other to prevent gaps in care. Strengthened patients' trust in care team members in addition to PCPs.	"I think how cohesively the care team works together makes a big impact. At many of our [non-exemplar] sites, often the care team doesn't make a move without getting the provider's permission first. The fact that they'll just dive into what the patient needs right then, and then loop in the provider later is unique." –PCP
Organizational support for and staff interest in innovation	Gave staff permission to try new approaches and take risks. Helped staff implement and hone new workflows and processes. Fostered a focus on using data to identify issues and implementing quality improvement projects. Enabled system-owned exemplars to undertake investments that would be too expensive to make on their own.	"We are very open [to our staff] identify[ing] potential problems. Small acts of change, or small plan-do-study cycle-type projects we do at an ongoing, never-ending basis. [This practice has] been very, very supportive of small tests of change consistently, [whether that is] workflow changes [or] IT changes. And because we're making micro-changes consistently, they tend to stick because they're not huge changes to the workflow re-design." –Pharmacist

AHR = acute hospitalization rate; CPC+ = Comprehensive Primary Care Plus; IT = information technology; PCP = primary care practitioner.

4.C.4. Discussion

Exemplars achieving a substantial two-year reduction in Medicare AHR described a variety of activities they perceived as preventing unnecessary hospitalizations. The activities exemplars perceived as most helpful align with three strategies: (1) promoting access to primary care, (2) identifying patients at high risk for hospitalization and addressing their needs with enhanced care management, and (3) expanding the breadth and depth of services offered at the primary care practice site. These activities also align with three of the defining elements of advanced primary care—accessibility, care coordination (including coordinating transitions of care and managing chronic conditions), and comprehensiveness (Starfield 1998; NAM 2021; WHO 1978)—all previously shown to be associated with reduced hospitalizations (Bindman et al. 1995; Rich et al. 2021a; Steiner et al. 2003; Fay 2018; Hsu et al. 2017; Coleman et al. 2006; O'Malley et al. 2019; O'Malley et al. 2021; Bazemore et al. 2015; Baker et al. 2018; Peikes et al. 2018a; Green at al. 2018; Yoon et al. 2013; Naylor et al. 2011).

Although many exemplars perceived similar activities to reduce AHR, no two exemplars used the same combination of activities. All exemplars leveraged available human and financial resources, chose strategies based on local circumstances and priorities, and dedicated additional staff resources to the selected activities. Exemplars used staff with relevant training and commitment, supported staff with a robust care team, and used data to pinpoint the highest-value activities (including patient subgroups). Our analysis also points to the importance of experience in practice transformation and organizational support for innovation. CPC+ payments enabled many of the exemplars' efforts. Some of the activities undertaken by exemplars may not be equally viable for smaller or less-resourced practices. Still, our findings may help practices choose a starting point for reducing AHR that matches their patient population, practice capabilities, and resources. Exemplars' perceptions of activities most beneficial to AHR reduction are especially relevant for practices participating in Primary Care First, which rewards reduced hospital utilization while giving practices flexibility in the care delivery innovations used to achieve this outcome (CMS 2021b).

Our study has limitations. First, the generalizability of our findings is limited because they are based on a small sample of predominantly larger practices. Second, the data might be subject to recall bias because we asked respondents to consider activities that occurred between 2016 and 2018, two to four years before our interviews. Finally, the findings are based on respondents' perceptions of activities that reduced AHR. The second phase of our research will test our hypotheses about how exemplars reduced AHR with data collected from all CPC+ practices (via practice and physician surveys, claims, and reports of care delivery activities).

Our findings suggest that AHR can be meaningfully reduced by strengthening the local primary care infrastructure through practice-driven, targeted changes in access, care management, and comprehensiveness of care. Other primary care practices taking on the challenging work of reducing hospitalizations can learn from exemplar CPC+ practices and may consider similar strategies, selecting activities that fit their context, personnel, patient population, and available resources.

4.C.5. Supplemental methods: A Bayesian multi-level regression analysis for identifying exemplar practices

In this section, we provide the technical details of our Bayesian multilevel regression analysis for identifying exemplar practices. In short, the analysis has two stages:

1. Estimating the adjusted acute hospitalization rate (AHR) for each practice for each year (2015–2018).
2. Based on these adjusted AHR estimates, estimating the probability that each practice experienced a true reduction in its adjusted AHR from 2016 to 2018 that is at least 5 percent better than that of the average practice.

Our approach allows us to address several pitfalls of a more basic analysis that would simply compare the raw AHR for each practice in 2016 versus 2018. We first describe these motivating pitfalls in detail, and then describe the two stages of our approach.

A. Pitfalls of a basic analysis and solutions offered by our Bayesian multilevel regression approach

1. **Compositional changes in a practice's patient mix can create the appearance of improvement that does not reflect actual practice transformation**

   For example, if the mix of beneficiaries served by a particular practice is on average at lower risk for acute hospitalizations (for example, a greater share of younger, healthier beneficiaries) after the implementation of Comprehensive Primary Care Plus (CPC+) than before, the practice would be more likely to experience a reduction in their raw AHR that was not due to any changes implemented by the practice. Using our Bayesian regression approach, we estimate a "risk-adjusted" AHR for each practice, defined as the expected AHR for that practice were it to have an "average" patient mix. The approach also adjusts for the effects of key practice-level covariates, such as Shared Savings Plan (SSP) status and the number of primary care providers, so that the adjusted AHR can be compared across practice types.[19] We do not include interactions that allow the *change* in AHR over time to vary by patient mix or practice characteristics because we do not want to remove these effects from resulting practice-specific estimates of the improvement in adjusted AHR. In other words, we regression-adjust the level rather than the change in AHR.

2. **Acute hospitalization rates from individual years can be noisy**

   In order to stabilize the adjusted AHR estimates, we include four years of data in our regression model, rather than only two. The four years of data include two years before CPC+ (2015–2016) and two years during CPC+ (2017–2018). The model takes into account the correlation in the AHRs for the same practice across the four years, providing more stable

[19] While this approach adjusts for observable differences in new versus continuing patients, it cannot account for any unobservable differences, such as new patients at the practice having lower rates of obesity than the practice's existing patients of the same age, or greater levels of physical activity.

estimates of the adjusted AHR for any particular year. Despite the inclusion of four years of data, exemplar identification focuses on changes in adjusted AHR from 2016 to 2018.

3. **Random chance can create the semblance of improvement, especially in small practices**

   Random noise, although always present, has a greater effect on the AHR of smaller practices than larger ones: a single hospitalization causes a larger change in the AHR for smaller practices because the AHR is defined per 1,000 attributed beneficiaries. A procedure that selects the practices with the largest improvements in performance based on the largest raw change is more likely to identify smaller practices whose AHR values are more likely to be extreme (for a more thorough discussion of this phenomenon, see Wainer 2007). Our Bayesian estimator controls for this inherent variability by shrinking the estimates for all practices towards the mean, with greater shrinkage for smaller practices. This helps to protect against spurious spikes and dips in the adjusted AHR that are likely due to chance.

4. **Focusing on a point estimate does not take into account the precision of the estimate**

   From our Bayesian model, we not only obtain a point estimate of the adjusted AHR for each practice—we also obtain the entire probability distribution of these estimates. From this distribution we calculate "exceedance probabilities," which are the Bayesian posterior probabilities that each practice achieves a reduction in its AHR that exceeds a policy-relevant threshold (Shwartz et al. 2014). The exceedance probability takes into account both the value and the precision of the estimate, and is consistent with the guidelines set forth by the Committee of Presidents of Statistical Societies (Ash et al. 2012). Thus, instead of identifying exemplars based on the largest expected relative reduction in acute hospitalizations, we identify them based on the highest probability of a "substantial" relative reduction in acute hospitalizations, which we define to be a reduction in the AHR that is at least 5 percent more than the reduction of the average practice.

Stage 1: Estimating the adjusted AHR

In the first stage of the analysis, we estimate the adjusted AHR for each practice for each year. This stage has two objectives: (1) risk adjustment to ensure that estimated improvements reflect true practice transformation rather than compositional changes in a practice's patient mix and (2) reliability adjustment (or "borrowing strength") to ensure that random chance doesn't create the semblance of improvement in small practices. Both of these goals are achieved by fitting a Bayesian multilevel linear regression model.

Data and analytic sample

To identify the CPC+ practices with the largest decreases in Medicare AHR over time, we construct a practice-level analytic file covering the period 2016 through 2018. We use data from several sources: Medicare claims and enrollment data; practice-specific data from the Centers for Medicare & Medicaid Services (CMS) and IQVIA (a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the country); publicly available data (e.g., Area Resource File); CMS restricted-use data (e.g., Master Data Management); and proprietary data (e.g., National Committee for Quality Assurance data).

To construct the yearly AHR, as well as baseline beneficiary characteristics, we start with a beneficiary-level file consisting of beneficiaries *we assigned* to CPC+ practices. We follow an intent-to-treat (ITT) approach and include the same set of beneficiaries (and practices) throughout the study, regardless of whether beneficiaries continue to visit the practices to which they were first attributed and regardless of whether the practices drop out of CPC+. To construct the beneficiary sample, we first conduct attribution for each quarter of the baseline and intervention periods based on the visits they made to health care practitioners over a two-year lookback period preceding the quarter. We next assign beneficiaries to CPC+ practices in two periods: the baseline period before CPC+ began (2015 and 2016) and the intervention period (2017 and 2018). Following the ITT approach, we assign beneficiaries to the first CPC+ practice to which they were attributed in the period, even if they began seeing a different primary care practice more frequently later in that period (as long as they satisfied the study's eligibility criteria). Further details on data sources and the construction of the analytic sample can be found in Appendix 5 of the third annual report for the independent evaluation of Comprehensive Primary Care Plus (Orzol et al. 2021) and in Singh et al. (2020).

We convert the yearly AHR and baseline beneficiary characteristics to practice-level measures by taking weighted averages across the beneficiaries attributed to each practice, as detailed in the next section.

Outcome and covariates

The primary outcome of interest is the AHR for practice *j* in year *t*, denoted Y_{jt} and defined as the number of acute hospitalizations per 1,000 beneficiary years. We calculate the AHR by dividing the total number of hospitalizations for that practice by the total follow-up time of those beneficiaries during the year, multiplied by 1,000:

$$(4.C.1.) \quad Y_{jt} = 1{,}000 \times \sum_i Y_{ijt}^{Bene} \Big/ \sum_i w_{ijt} \ ,$$

Here, Y_{ijt}^{Bene} is the number of acute hospitalizations for beneficiary *i* in practice *j* during year *t*, and w_{ijt} is an enrollment weight equal to the proportion of the year that the beneficiary was observed ($w_{ijt} = 0.5$ indicates that the beneficiary was observed for 6 of the 12 months in that year).

Covariates included in the model fall into two categories: (1) time-specific weighted averages of baseline beneficiary-level characteristics (which account for the patient mix for each practice at every time) (Table 4.C.6) and (2) baseline practice- and market-level characteristics (Table 4.C.7). The weighted averages of beneficiary characteristics are computed using the beneficiary-specific enrollment weights (w_{ijt}) for each beneficiary at each time point. Note that in calculating average beneficiary characteristics for a given practice in a given year, we only use baseline values of covariates for beneficiaries attributed to the practice for that year (such as average baseline hierarchical condition category, or HCC, of practice enrollees attributed to the practice in 2018) to avoid changes in covariate values that are endogenous to CPC+. The weighted averages (e.g., average baseline HCC score) vary with time to reflect compositional changes in a practice's beneficiary population.

Table 4.C.6. Beneficiary characteristics included in risk adjustment at baseline, 2016

Beneficiary characteristics
Proportions of beneficiaries in age ranges under 65, 65–74, 75–84, and 85 and above
Proportion of male beneficiaries
Proportions of beneficiaries in race categories White, Black, and other/unknown
Proportions of beneficiaries with original reason for entitlement category age, disability, and end-stage renal disease
Proportion of dually eligible beneficiaries
Average HCC (normalized), as well as the proportion of beneficiaries whose HCC score is a new enrollee score, based on general characteristics of the beneficiary rather than the beneficiary's claims history
Proportions of beneficiaries with each of 21 HCC combination flags:
Metastatic Cancer and Acute Leukemia
Diabetes with Chronic Complications
Malnutrition
Morbid Obesity
Other Significant Endocrine or Metabolic Disorders
Congestive Heart Failure
Specified Heart Arrhythmias
Atherosclerosis of the Extremities with Ulceration of Gangrene
Chronic Obstructive Pulmonary Disease
Traumatic Amputations and Complications
Major Organ Transplant or Replacement Status
Rheumatoid Arthritis/Disorders of Immunity
Severe Hematological Disorders/Coagulation Defects
Drug/Alcohol Psychosis or Dependence
Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders
Quadri/Para-plegia
Coma, Brain Compression/Anoxic Damage/Respirator Dependence/Tracheostomy Status
Ischemic Heart Disease, Acute Myocardial Infarction, Angina
Stroke (Cerebral Hemorrhage, Ischemic or Unspecified Stroke)
Vascular Disease, with or without complications
Pressure Ulcer of Skin
Proportion of beneficiaries with Alzheimer’s or dementia (based on CCW Alzheimer’s and dementia condition flag)

CCW = Chronic Conditions Warehouse; HCC = hierarchical condition category;

Table 4.C.7. Practice and market characteristics included in risk adjustment at baseline, 2016

Practice and Market Characteristics
Indicator for participation in the Medicare Shared Savings Program (participating as of January 1, 2017)
Practice region (Northeast, Midwest, South, West)
Number of primary care practitioners category (1–2, 3–5, 6+)
Indicator for whether practice has nurse practitioners or physician's assistants
Indicator for whether the practice is a multispecialty practice
Indicator for whether the practice is owned or managed by a health system or owned by a hospital
Indicator for prior primary care transformation experience, combining PCMH recognition, MAPCP, and CPC Classic
Indicator for meaningful use of electronic health records
Medicare Advantage penetration rate
Median household income in the practice county
Geography category (rural, suburban, urban)
Indicator for whether the practice was ever in a whole county Health Professional Shortage Area
Hospital referral region price index
Percentage of residents in the practice county below the poverty line
Percentage of individuals 25 or older in the practice county with 4 years of college education
Number of hospital beds per 1,000 population in the practice county (quartiles)
Indicator for whether the majority of beneficiaries attributed to the practice are Native American

CPC + Comprehensive Primary Care; MAPCP = Multi-payer Advanced Primary Care Practice; PCMH = patient-centered medical home.

Model

We fit a Bayesian, multilevel linear regression model in order to estimate the adjusted AHR for each year. Let *j* index the CPC+ practice and t index time in years (-1 for 2015, 0 for 2016, 1 for 2017, and 2 for 2018). Our multilevel linear regression model takes the following form:

$$(4.C.2.)\quad \begin{aligned} Y_{jt} = \;& X^B_{jt}\beta^B + X^P_{jt}\beta^P + \gamma_t + \theta_{jt} + \in_{jt} \\ & \in_{jt} \sim N\left(0, \sigma^2 / w_{jt}\right) \end{aligned} .$$

In this model, Y_{jt} is the AHR for practice *j* at time *t*, and X^B_{jt} and X^P_j are beneficiary and practice-specific covariates, respectively, listed in Tables 4.C.6 and 4.C.7. From this model, the adjusted AHR for practice *j* at time *t* is the sum of the average AHR for time *t* (represented by γ_t) and the practice-time deviation from that average AHR for practice *j* (represented by θ_{jt}). The parameters β^B and β^P account for the effect of aggregated beneficiary-level and practice-level covariates, respectively, which allow for risk adjustment.

The AHR variance $\in_{jt}$ scales with w_{ijt} (where w_{ijt} is the number of beneficiary-years at practice *j* at time *t*), meaning that the variance of $\in_{jt}$ decreases as the practice size increases. This approach is a Bayesian analogue of a frequentist practice-level model in which larger practices receive a larger weight than smaller practices (Gelman et al. 2014).

The Bayesian model is made complete by applying prior distributions to all model parameters. We follow the current best practices in Bayesian data analysis in determining the appropriate prior distributions for each parameter (Stan Development Team 2020). Among these priors is a multivariate normal prior applied to the practice-time random effects θ_{jt}; this prior promotes appropriate borrowing of strength across practices and over time. The degree to which strength is borrowed is data driven, depending on two factors: (1) how similar the observations from practice *j* are to other practices, and (2) the amount of weight (w_{ijt}) that is assigned to practice *j*. The random effects for practices that appear very different from other practices (after risk adjustment), especially those that have low weight (i.e., smaller practices), borrow more information from other practices.

We fit this model using Stan, a state-of-the-art, probabilistic programming language designed to fit Bayesian models (Carpenter et al. 2017). We conduct all data pre-processing and post-processing using the R statistical software environment (R Core Team 2018). Once we fit the model, we calculate the adjusted AHR for each practice and year, denoted $\tilde{Y}_{jt}$, as

$$(4.C.3.)\quad \tilde{Y}_{jt} = E\left[Y_{jt} \middle| X^B_{jt} = X^P_{jt} = 0 \right] = \hat{\gamma}_t + \hat{\theta}_{jt}$$

Stage 2: Calculating each practice's probability of a substantial reduction in adjusted AHR

Our procedure for selecting exemplars is not based on the practices that had the largest *absolute* reduction in adjusted AHR but instead on the practices that had the highest probability of having a substantial *relative* reduction. We measure this by first estimating the relative change in adjusted AHR for each practice, above and beyond the average practice, as

$$(4.C.4.)\quad \Delta_j = \frac{\left(\tilde{Y}_{j2} - \tilde{Y}_{j0}\right) - E_j\left[\tilde{Y}_{j2} - \tilde{Y}_{j0}\right]}{\tilde{Y}_{j0}} = \frac{\theta_{j2} - \theta_{j0}}{\gamma_0 + \theta_{j0}}$$

The Bayesian modeling approach that we use in Stage 1 allows us to make probability statements about the model parameters of the form "there is a 75 percent chance that practice *j* had a relative reduction in adjusted AHR of at least 5 percent more than average" (i.e., $\Pr\left(\Delta_j < -0.05\right) = 0.75$). As described in the main body of the manuscript, we select as exemplars those practices with the largest probability of having a "substantial" reduction in their adjusted AHR, which we define to be a relative reduction (Δ_j) of at least 5 percent.

APPENDIX 5

5.A. Detailed results over the first four program years of CPC+

This Appendix supplements the main chapter by providing yearly impact estimates as well as detailed findings from subgroup analyses, sensitivity tests, and aggregate impact results. We focus on those practices that started in 2017.[20] We begin by reporting findings for Track 1 CPC+ practices and then turn to Track 2 CPC+ practices.

The methods underlying our impact analyses rely on a difference-in-differences estimation strategy that was adjusted to account for potential bias in our impact estimates due to the COVID-19 pandemic. In particular, we added COVID-19-specific region-level control variables to our regression models. Details on the additional control variables added to our models, and their specifications are described in Appendices 5.D (Implications of COVID-19 for the CPC+ Impact Evaluation) and 5.E (Empirical Strategy).

5.A.1. Results for CPC+ Track 1 practices

A. Expenditures for Medicare fee-for-service (FFS) beneficiaries

A.1. Medicare expenditures without CMS's enhanced payments

Over the first four program years, CPC+ Track 1 had no discernible effects on Medicare expenditures for FFS beneficiaries when excluding CMS's enhanced payments. Relative to expenditures among comparison practices, average annual Medicare expenditures for Part A and B services did not differ for CPC+ practices in Track 1 ($1.8 per beneficiary per month [PBPM], 0.2 percent, $p = 0.58$; Table 5.A.1). Estimated effects on Medicare expenditures were similar in each of the program years. Results were mostly similar in sensitivity tests, including when using a triple-differences approach (see Appendix 5.G and Section A.4 in this Appendix for more details).

Quarterly trends in Medicare expenditures without CMS's enhanced payments continued to be similar for Track 1 CPC+ and comparison practices, with expenditures steadily increasing over time (Figure 5.A.1). Notably, Medicare expenditures without CMS's enhanced payments dropped sharply during the first two quarters of 2020 due to the COVID-19 pandemic before returning to pre-pandemic levels in the fourth quarter of 2020.

[20] In this appendix, we do not analyze or report on the practices that joined CPC+ in 2018, as these practices account for only 5 percent of the total number of practices participating in CPC+, and previous analyses found that the experiences of these practices were very similar to the experiences of those that joined CPC+ in 2017 (Anglin et al. 2020).

Table 5.A.1. Regression-adjusted means and estimated impact of CPC+ on selected Medicare expenditure outcomes for attributed Medicare FFS beneficiaries over the first four program years, Track 1

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Medicare expenditures (per beneficiary per month)																		
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP[d]																		
Baseline	$881	$884	NA	NA	NA	NA	$906	$905	NA	NA	NA	NA	$854	$861	NA	NA	NA	NA
PY 1	$899	$898	$4.8 ($3.4)	0.5%	(-$0.8, $10.4)	0.16	$924	$921	$1.4 ($4.5)	0.1%	(-$6.1, $8.8)	0.76	$874	$871	$8.4 ($5.1)	1.0%	($0.0, $16.8)	0.10
PY 2	$949	$949	$3.8 ($3.6)	0.4%	(-$2.1, $9.6)	0.29	$975	$973	$0.0 ($4.9)	0.0%	(-$8.0, $8.0)	1.00	$923	$921	$7.7 ($5.3)	0.8%	(-$0.9, $16.4)	0.14
PY 3	$995	$996	$1.9 ($4.1)	0.2%	(-$4.9, $8.6)	0.65	$1,017	$1,024	-$8.5 ($5.5)	-0.8%	(-$17.5, $0.5)	0.12	$972	$965	$13.2** ($6.1)	1.4%	($3.1, $23.3)	0.03
PY 4	$944	$949	-$2.0 ($4.5)	-0.2%	(-$9.4, $5.4)	0.66	$961	$975	-$14.9** ($6.4)	-1.5%	(-$25.5, -$4.4)	0.02	$926	$921	$11.0* ($6.4)	1.2%	($0.4, $21.5)	0.09
PY 1 through 4	$948	$950	$1.8 ($3.2)	0.2%	(-$3.5, $7.0)	0.58	$971	$975	-$5.9 ($4.4)	-0.6%	(-$13.1, $1.3)	0.18	$926	$922	$9.8** ($4.7)	1.1%	($2.0, $17.5)	0.04
Medicare Part A and B expenditures including care management fees																		
Baseline	$881	$884	NA	NA	NA	NA	$906	$905	NA	NA	NA	NA	$854	$861	NA	NA	NA	NA
PY 1	$913	$898	$18.6*** ($3.4)	2.1%	($13.1, $24.2)	0.00	$938	$921	$15.3*** ($4.5)	1.7%	($7.9, $22.8)	0.00	$887	$871	$22.1*** ($5.1)	2.6%	($13.7, $30.5)	0.00
PY 2	$962	$949	$16.4*** ($3.6)	1.7%	($10.5, $22.3)	0.00	$987	$973	$12.6*** ($4.9)	1.3%	($4.6, $20.7)	0.01	$936	$921	$20.4*** ($5.3)	2.2%	($11.6, $29.1)	0.00
PY 3	$1,007	$996	$13.6*** ($4.1)	1.4%	($6.8, $20.3)	0.00	$1,029	$1,024	$3.3 ($5.5)	0.3%	(-$5.7, $12.3)	0.55	$983	$965	$24.9*** ($6.1)	2.6%	($14.7, $35.0)	0.00
PY 4	$955	$949	$9.0** ($4.5)	0.9%	($1.5, $16.4)	0.05	$972	$975	-$3.9 ($6.4)	-0.4%	(-$14.5, $6.6)	0.54	$937	$922	$21.8*** ($6.4)	2.4%	($11.2, $32.3)	0.00
PY 1 through 4	$961	$950	$14.0*** ($3.2)	1.5%	($8.8, $19.3)	0.00	$983	$975	$6.4 ($4.4)	0.7%	(-$0.7, $13.6)	0.14	$938	$922	$21.9*** ($4.7)	2.4%	($14.2, $29.7)	0.00
Medicare Part A and B expenditures including care management fees, Performance-based Incentive Payments, and shared savings payments to SSP ACOs[e]																		
Baseline	$883	$886	NA	NA	NA	NA	$910	$908	NA	NA	NA	NA	$855	$861	NA	NA	NA	NA
PY 1	$917	$900	$19.5*** ($3.4)	2.2%	($13.9, $25.1)	0.00	$943	$926	$15.7*** ($4.5)	1.7%	($8.2, $23.1)	0.00	$889	$872	$23.5*** ($5.1)	2.7%	($15.1, $31.9)	0.00
PY 2	$966	$952	$17.6*** ($3.6)	1.9%	($11.7, $23.4)	0.00	$994	$978	$13.8*** ($4.8)	1.4%	($5.8, $21.7)	0.00	$938	$922	$21.6*** ($5.3)	2.4%	($12.9, $30.3)	0.00
PY 3	$1,012	$1,001	$14.2*** ($4.1)	1.4%	($7.5, $20.9)	0.00	$1,037	$1,031	$4.3 ($5.4)	0.4%	(-$4.5, $13.2)	0.42	$986	$967	$25.0*** ($6.2)	2.6%	($14.9, $35.1)	0.00
PY 4	$961	$957	$6.9 ($4.5)	0.7%	(-$0.5, $14.3)	0.13	$981	$987	-$7.5 ($6.4)	-0.8%	(-$18.0, $3.0)	0.24	$941	$926	$21.4*** ($6.4)	2.3%	($10.9, $32.0)	0.00
PY 1 through 4	$966	$954	$14.1*** ($3.2)	1.5%	($8.9, $19.3)	0.00	$990	$982	$6.2 ($4.3)	0.6%	(-$0.9, $13.3)	0.15	$940	$924	$22.5*** ($4.7)	2.5%	($14.8, $30.3)	0.00

Table 5.A.1 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Medicare expenditures by service category (per beneficiary per month)[f]																		
Inpatient expenditures																		
Baseline	$311	$318	NA	NA	NA	NA	$318	$322	NA	NA	NA	NA	$303	$314	NA	NA	NA	NA
PY 1	$316	$320	$2.7 ($2.3)	0.9%	(-$1.1, $6.5)	0.24	$323	$326	$0.5 ($3.0)	0.2%	(-$4.4, $5.4)	0.86	$308	$314	$5.0 ($3.5)	1.6%	(-$0.8, $10.8)	0.16
PY 2	$322	$328	$0.6 ($2.3)	0.2%	(-$3.2, $4.3)	0.81	$331	$335	-$0.6 ($3.1)	-0.2%	(-$5.7, $4.5)	0.85	$312	$321	$1.8 ($3.4)	0.6%	(-$3.7, $7.4)	0.59
PY 3	$333	$343	-$2.6 ($2.5)	-0.8%	(-$6.7, $1.6)	0.31	$341	$351	-$6.6* ($3.5)	-1.9%	(-$12.3, -$0.9)	0.06	$325	$333	$1.9 ($3.7)	0.6%	(-$4.2, $8.0)	0.60
PY 4	$314	$326	-$5.1** ($2.6)	-1.6%	(-$9.3, -$0.8)	0.05	$319	$336	-$12.2*** ($3.6)	-3.7%	(-$18.2, -$6.2)	0.00	$308	$316	$2.1 ($3.7)	0.7%	(-$4.1, $8.2)	0.58
PY 1 through 4	$321	$330	-$1.4 ($2.0)	-0.4%	(-$4.6, $1.9)	0.49	$329	$337	-$5.0* ($2.7)	-1.5%	(-$9.4, -$0.6)	0.06	$313	$321	$2.5 ($3.0)	0.8%	(-$2.4, $7.4)	0.40
Expenditures for acute inpatient care[g]																		
Baseline	$275	$282	NA	NA	NA	NA	$282	$285	NA	NA	NA	NA	$268	$278	NA	NA	NA	NA
PY 1	$279	$285	$1.1 ($2.0)	0.4%	(-$2.2, $4.4)	0.59	$285	$290	-$1.5 ($2.6)	-0.5%	(-$5.8, $2.8)	0.57	$273	$279	$3.9 ($3.1)	1.4%	(-$1.3, $9.0)	0.22
PY 2	$285	$293	-$1.7 ($2.0)	-0.6%	(-$5.1, $1.6)	0.38	$292	$299	-$2.7 ($2.7)	-0.9%	(-$7.1, $1.8)	0.32	$276	$287	-$0.7 ($3.0)	-0.3%	(-$5.6, $4.2)	0.81
PY 3	$295	$306	-$4.6** ($2.2)	-1.5%	(-$8.2, -$1.0)	0.04	$302	$314	-$8.3*** ($3.0)	-2.7%	(-$13.3, -$3.3)	0.01	$288	$298	-$0.4 ($3.2)	-0.1%	(-$5.7, $4.9)	0.90
PY 4	$278	$292	-$6.7*** ($2.3)	-2.4%	(-$10.5, -$2.9)	0.00	$284	$300	-$12.5*** ($3.2)	-4.2%	(-$17.8, -$7.2)	0.00	$272	$283	-$1.0 ($3.3)	-0.4%	(-$6.5, $4.4)	0.75
PY 1 through 4	$284	$294	-$3.3* ($1.7)	-1.1%	(-$6.1, -$0.4)	0.06	$291	$301	-$6.5*** ($2.3)	-2.2%	(-$10.3, -$2.7)	0.01	$277	$287	$0.2 ($2.6)	0.1%	(-$4.1, $4.5)	0.94
Inpatient rehabilitation facility expenditures																		
Baseline	$20	$21	NA	NA	NA	NA	$21	$21	NA	NA	NA	NA	$20	$21	NA	NA	NA	NA
PY 1	$22	$21	$0.8* ($0.4)	3.8%	($0.1, $1.5)	0.07	$22	$21	$0.6 ($0.6)	2.8%	(-$0.4, $1.6)	0.33	$21	$21	$1.0 ($0.6)	5.0%	($0.0, $2.0)	0.11
PY 2	$23	$22	$1.5*** ($0.5)	7.1%	($0.7, $2.3)	0.00	$23	$22	$1.0 ($0.7)	4.6%	(-$0.1, $2.2)	0.13	$22	$21	$2.0*** ($0.7)	10.0%	($0.9, $3.2)	0.00
PY 3	$24	$23	$1.1** ($0.5)	4.9%	($0.3, $1.9)	0.03	$24	$23	$0.3 ($0.7)	1.1%	(-$0.9, $1.4)	0.71	$23	$22	$2.0*** ($0.7)	9.2%	($0.8, $3.2)	0.01
PY 4	$23	$22	$1.2** ($0.5)	5.5%	($0.4, $2.0)	0.02	$23	$23	-$0.3 ($0.7)	-1.3%	(-$1.5, $0.9)	0.68	$24	$22	$2.7*** ($0.7)	13.2%	($1.6, $3.9)	0.00
PY 1 through 4	$23	$22	$1.2*** ($0.4)	5.4%	($0.5, $1.8)	0.00	$23	$22	$0.4 ($0.6)	1.9%	(-$0.5, $1.4)	0.45	$23	$22	$2.0*** ($0.5)	9.5%	($1.1, $2.9)	0.00
Outpatient expenditures																		
Baseline	$165	$169	NA	NA	NA	NA	$164	$168	NA	NA	NA	NA	$167	$171	NA	NA	NA	NA

Table 5.A.1 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 1	$177	$180	$0.9 ($0.8)	0.5%	(-$0.5, $2.2)	0.31	$176	$179	$0.8 ($1.1)	0.5%	(-$1.0, $2.6)	0.48	$177	$181	$0.9 ($1.3)	0.5%	(-$1.2, $3.0)	0.48
PY 2	$199	$201	$1.7 ($1.1)	0.9%	(-$0.1, $3.5)	0.13	$197	$200	$0.9 ($1.4)	0.5%	(-$1.4, $3.2)	0.52	$201	$203	$2.5 ($1.8)	1.3%	(-$0.4, $5.4)	0.15
PY 3	$214	$217	$1.1 ($1.3)	0.5%	(-$1.1, $3.3)	0.40	$211	$216	-$1.2 ($1.6)	-0.6%	(-$3.9, $1.5)	0.46	$217	$218	$3.6* ($2.1)	1.7%	($0.2, $7.1)	0.08
PY 4	$203	$208	-$0.6 ($1.5)	-0.3%	(-$3.2, $1.9)	0.69	$200	$205	-$1.7 ($1.9)	-0.8%	(-$4.9, $1.5)	0.38	$207	$211	$0.5 ($2.4)	0.2%	(-$3.5, $4.5)	0.84
PY 1 through 4	$199	$202	$0.8 ($1.0)	0.4%	(-$0.9, $2.4)	0.45	$197	$201	-$0.3 ($1.2)	-0.2%	(-$2.3, $1.7)	0.81	$201	$204	$1.9 ($1.6)	0.9%	(-$0.8, $4.5)	0.24
Expenditures for outpatient ED visits, including observation stays[h]																		
Baseline	$25	$26	NA	NA	NA	NA	$25	$26	NA	NA	NA	NA	$25	$26	NA	NA	NA	NA
PY 1	$26	$27	$0.1 ($0.2)	0.3%	(-$0.2, $0.4)	0.63	$26	$27	$0.2 ($0.2)	0.8%	(-$0.2, $0.6)	0.37	$27	$28	$0.0 ($0.3)	-0.2%	(-$0.5, $0.4)	0.89
PY 2	$28	$29	$0.0 ($0.2)	0.1%	(-$0.4, $0.4)	0.91	$28	$28	$0.4 ($0.3)	1.6%	(-$0.1, $0.9)	0.15	$28	$30	-$0.4 ($0.4)	-1.5%	(-$1.0, $0.2)	0.26
PY 3	$29	$30	-$0.1 ($0.2)	-0.3%	(-$0.5, $0.3)	0.72	$28	$30	-$0.1 ($0.3)	-0.3%	(-$0.6, $0.4)	0.77	$30	$31	-$0.1 ($0.4)	-0.3%	(-$0.7, $0.5)	0.79
PY 4	$24	$25	-$0.2 ($0.2)	-0.6%	(-$0.6, $0.3)	0.54	$23	$24	-$0.1 ($0.3)	-0.5%	(-$0.6, $0.4)	0.74	$25	$27	-$0.2 ($0.4)	-0.7%	(-$0.8, $0.4)	0.62
PY 1 through 4	$27	$28	$0.0 ($0.2)	-0.2%	(-$0.4, $0.3)	0.83	$26	$27	$0.1 ($0.2)	0.4%	(-$0.3, $0.5)	0.65	$27	$29	-$0.2 ($0.3)	-0.7%	(-$0.7, $0.3)	0.51
Expenditures for physician and nonphysician Part B noninstitutional services in any setting[i]																		
Baseline	$254	$242	NA	NA	NA	NA	$269	$254	NA	NA	NA	NA	$238	$229	NA	NA	NA	NA
PY 1	$258	$247	$0.0 ($0.8)	0.0%	(-$1.3, $1.3)	0.99	$272	$259	-$1.4 ($1.1)	-0.5%	(-$3.2, $0.4)	0.21	$244	$233	$1.4 ($1.1)	0.6%	(-$0.5, $3.3)	0.22
PY 2	$275	$262	$1.3 ($1.0)	0.5%	(-$0.3, $3.0)	0.19	$289	$275	$0.1 ($1.3)	0.0%	(-$2.0, $2.3)	0.92	$259	$247	$2.6* ($1.6)	1.0%	($0.1, $5.2)	0.09
PY 3	$289	$275	$2.6** ($1.2)	0.9%	($0.6, $4.7)	0.03	$305	$289	$1.3 ($1.6)	0.4%	(-$1.2, $3.9)	0.39	$274	$260	$4.1** ($1.9)	1.5%	($1.0, $7.2)	0.03
PY 4	$269	$254	$3.2** ($1.4)	1.2%	($0.9, $5.4)	0.02	$282	$267	$1.0 ($1.8)	0.4%	(-$1.9, $4.0)	0.56	$256	$241	$5.6*** ($2.1)	2.2%	($2.1, $9.1)	0.01
PY 1 through 4	$273	$260	$1.8* ($1.0)	0.7%	($0.2, $3.3)	0.06	$287	$273	$0.2 ($1.2)	0.1%	(-$1.8, $2.3)	0.85	$259	$246	$3.4** ($1.5)	1.3%	($1.0, $5.8)	0.02
Expenditures for ambulatory visits with primary care practitioners																		
Baseline	$24	$24	NA	NA	NA	NA	$24	$25	NA	NA	NA	NA	$23	$23	NA	NA	NA	NA
PY 1	$24	$25	-$0.2* ($0.1)	-0.8%	(-$0.4, $0.0)	0.07	$24	$25	-$0.2 ($0.1)	-0.8%	(-$0.4, $0.0)	0.16	$24	$24	-$0.2 ($0.1)	-0.7%	(-$0.4, $0.1)	0.24
PY 2	$25	$26	-$0.1 ($0.1)	-0.2%	(-$0.3, $0.2)	0.70	$25	$26	-$0.2 ($0.2)	-0.6%	(-$0.4, $0.1)	0.38	$25	$25	$0.1 ($0.2)	0.2%	(-$0.3, $0.4)	0.77

Table 5.A.1 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 3	$27	$27	-$0.2 ($0.2)	-0.7%	(-$0.4, $0.1)	0.25	$27	$28	-$0.2 ($0.2)	-0.6%	(-$0.5, $0.2)	0.41	$26	$26	-$0.2 ($0.2)	-0.7%	(-$0.6, $0.2)	0.43
PY 4	$24	$24	-$0.3 ($0.2)	-1.3%	(-$0.6, $0.0)	0.10	$24	$25	-$0.2 ($0.2)	-0.6%	(-$0.5, $0.2)	0.51	$24	$24	-$0.5* ($0.3)	-2.0%	(-$1.0, $0.0)	0.10
PY 1 through 4	$25	$26	-$0.2 ($0.1)	-0.7%	(-$0.4, $0.0)	0.15	$25	$26	-$0.2 ($0.2)	-0.7%	(-$0.4, $0.1)	0.29	$25	$25	-$0.2 ($0.2)	-0.8%	(-$0.5, $0.1)	0.31
Expenditures for ambulatory visits with primary care practitioners at assigned practice[j]																		
Baseline	$17	$17	NA	NA	NA	NA	$17	$17	NA	NA	NA	NA	$17	$16	NA	NA	NA	NA
PY 1	$17	$16	-$0.1 ($0.1)	-0.6%	(-$0.3, $0.1)	0.39	$17	$17	-$0.2 ($0.1)	-1.0%	(-$0.4, $0.1)	0.28	$17	$16	$0.0 ($0.2)	-0.1%	(-$0.3, $0.2)	0.91
PY 2	$15	$15	$0.1 ($0.2)	0.9%	(-$0.1, $0.4)	0.38	$15	$16	$0.0 ($0.2)	0.0%	(-$0.3, $0.4)	0.98	$15	$14	$0.3 ($0.2)	1.9%	(-$0.1, $0.7)	0.23
PY 3	$15	$15	$0.1 ($0.2)	0.5%	(-$0.2, $0.4)	0.68	$15	$15	$0.1 ($0.2)	0.9%	(-$0.3, $0.5)	0.58	$15	$14	$0.0 ($0.3)	0.2%	(-$0.5, $0.5)	0.93
PY 4	$12	$12	-$0.2 ($0.2)	-1.5%	(-$0.6, $0.2)	0.45	$12	$12	-$0.1 ($0.3)	-0.7%	(-$0.5, $0.4)	0.78	$12	$11	-$0.3 ($0.4)	-2.1%	(-$0.9, $0.4)	0.50
PY 1 through 4	$15	$14	$0.0 ($0.1)	-0.1%	(-$0.3, $0.2)	0.95	$15	$15	$0.0 ($0.2)	-0.2%	(-$0.3, $0.3)	0.89	$15	$14	$0.0 ($0.2)	0.1%	(-$0.4, $0.4)	0.96
Expenditures for ambulatory visits with primary care practitioners at non-assigned practice[j]																		
Baseline	$7	$7	NA	NA	NA	NA	$7	$7	NA	NA	NA	NA	$7	$7	NA	NA	NA	NA
PY 1	$8	$8	-$0.1 ($0.1)	-1.2%	(-$0.2, $0.0)	0.16	$8	$8	$0.0 ($0.1)	-0.4%	(-$0.2, $0.1)	0.75	$8	$8	-$0.2* ($0.1)	-2.0%	(-$0.3, $0.0)	0.10
PY 2	$10	$11	-$0.2* ($0.1)	-1.8%	(-$0.4, $0.0)	0.10	$10	$11	-$0.2 ($0.2)	-1.5%	(-$0.4, $0.1)	0.36	$10	$11	-$0.2 ($0.2)	-2.2%	(-$0.5, $0.0)	0.15
PY 3	$11	$12	-$0.3* ($0.1)	-2.2%	(-$0.5, $0.0)	0.06	$11	$12	-$0.3 ($0.2)	-2.4%	(-$0.6, $0.0)	0.14	$11	$12	-$0.2 ($0.2)	-1.9%	(-$0.5, $0.1)	0.26
PY 4	$12	$12	-$0.1 ($0.2)	-1.1%	(-$0.4, $0.2)	0.48	$12	$13	-$0.1 ($0.2)	-0.6%	(-$0.5, $0.3)	0.76	$12	$13	-$0.2 ($0.3)	-2.0%	(-$0.7, $0.2)	0.39
PY 1 through 4	$10	$11	-$0.2 ($0.1)	-1.6%	(-$0.3, $0.0)	0.10	$10	$11	-$0.1 ($0.1)	-1.3%	(-$0.4, $0.1)	0.36	$10	$11	-$0.2 ($0.1)	-2.1%	(-$0.5, $0.0)	0.14
Expenditures for ambulatory visits with specialists																		
Baseline	$25	$24	NA	NA	NA	NA	$28	$26	NA	NA	NA	NA	$23	$22	NA	NA	NA	NA
PY 1	$25	$24	$0.1 ($0.1)	0.4%	($0.0, $0.2)	0.13	$27	$25	$0.0 ($0.1)	-0.2%	(-$0.2, $0.1)	0.57	$23	$22	$0.2*** ($0.1)	1.1%	($0.1, $0.4)	0.01
PY 2	$26	$24	$0.2** ($0.1)	0.7%	($0.0, $0.3)	0.03	$28	$26	$0.1 ($0.1)	0.4%	(-$0.1, $0.3)	0.34	$23	$22	$0.2** ($0.1)	1.1%	($0.1, $0.4)	0.03
PY 3	$26	$25	$0.1 ($0.1)	0.2%	(-$0.1, $0.2)	0.50	$28	$27	$0.0 ($0.1)	0.0%	(-$0.2, $0.2)	0.98	$23	$23	$0.2 ($0.1)	0.7%	(-$0.1, $0.4)	0.24

Table 5.A.1 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 4	$22	$21	$0.0 ($0.1)	-0.1%	(-$0.2, $0.1)	0.79	$24	$23	-$0.3* ($0.1)	-1.1%	(-$0.5, $0.0)	0.05	$20	$19	$0.3** ($0.1)	1.5%	($0.1, $0.5)	0.05
PY 1 through 4	$25	$23	$0.1 ($0.1)	0.3%	($0.0, $0.2)	0.33	$27	$25	-$0.1 ($0.1)	-0.2%	(-$0.2, $0.1)	0.59	$22	$22	$0.2** ($0.1)	1.0%	($0.1, $0.4)	0.03
Skilled nursing facility expenditures																		
Baseline	$67	$68	NA	NA	NA	NA	$71	$72	NA	NA	NA	NA	$63	$64	NA	NA	NA	NA
PY 1	$65	$66	$0.4 ($0.7)	0.7%	(-$0.7, $1.6)	0.54	$69	$70	$0.3 ($1.0)	0.4%	(-$1.3, $1.8)	0.78	$61	$61	$0.5 ($1.0)	0.9%	(-$1.1, $2.2)	0.59
PY 2	$64	$66	-$0.1 ($0.7)	-0.2%	(-$1.3, $1.1)	0.88	$68	$70	-$0.5 ($1.0)	-0.7%	(-$2.1, $1.2)	0.65	$61	$61	$0.2 ($1.0)	0.3%	(-$1.5, $1.9)	0.86
PY 3	$63	$65	-$0.5 ($0.8)	-0.7%	(-$1.8, $0.8)	0.54	$66	$70	-$2.4** ($1.1)	-3.6%	(-$4.3, -$0.6)	0.03	$60	$60	$1.6 ($1.1)	2.8%	(-$0.2, $3.4)	0.13
PY 4	$64	$65	-$0.6 ($1.1)	-1.0%	(-$2.5, $1.2)	0.55	$67	$71	-$3.3* ($1.8)	-4.7%	(-$6.2, -$0.3)	0.07	$60	$60	$1.7 ($1.3)	3.0%	(-$0.5, $4.0)	0.19
PY 1 through 4	$64	$66	-$0.3 ($0.6)	-0.4%	(-$1.3, $0.8)	0.70	$67	$70	-$1.5 ($0.9)	-2.2%	(-$3.1, $0.0)	0.11	$61	$61	$1.0 ($0.9)	1.7%	(-$0.4, $2.4)	0.25
Home health expenditures																		
Baseline	$39	$41	NA	NA	NA	NA	$40	$44	NA	NA	NA	NA	$39	$38	NA	NA	NA	NA
PY 1	$39	$41	-$0.3 ($0.3)	-0.7%	(-$0.7, $0.2)	0.34	$40	$44	-$0.1 ($0.4)	-0.2%	(-$0.7, $0.6)	0.87	$39	$38	-$0.5 ($0.4)	-1.3%	(-$1.2, $0.2)	0.22
PY 2	$39	$42	-$1.0*** ($0.3)	-2.6%	(-$1.6, -$0.5)	0.00	$40	$45	-$1.3*** ($0.4)	-3.2%	(-$2.0, -$0.6)	0.00	$39	$39	-$0.8 ($0.5)	-1.9%	(-$1.5, $0.0)	0.10
PY 3	$39	$42	-$1.6*** ($0.4)	-3.9%	(-$2.2, -$1.0)	0.00	$39	$45	-$1.7*** ($0.5)	-4.2%	(-$2.5, -$1.0)	0.00	$39	$40	-$1.5*** ($0.6)	-3.7%	(-$2.4, -$0.6)	0.01
PY 4	$35	$39	-$1.6*** ($0.4)	-4.3%	(-$2.3, -$0.9)	0.00	$35	$40	-$1.4** ($0.5)	-3.8%	(-$2.3, -$0.5)	0.01	$35	$36	-$1.9*** ($0.6)	-5.0%	(-$2.9, -$0.8)	0.00
PY 1 through 4	$38	$41	-$1.2*** ($0.3)	-3.0%	(-$1.7, -$0.7)	0.00	$38	$44	-$1.2*** ($0.4)	-3.0%	(-$1.8, -$0.6)	0.00	$38	$38	-$1.2*** ($0.4)	-3.1%	(-$1.9, -$0.5)	0.01
Hospice expenditures																		
Baseline	$23	$24	NA	NA	NA	NA	$22	$25	NA	NA	NA	NA	$23	$23	NA	NA	NA	NA
PY 1	$24	$24	$1.1*** ($0.4)	4.8%	($0.5, $1.8)	0.01	$24	$25	$1.5*** ($0.5)	6.4%	($0.6, $2.4)	0.01	$24	$24	$0.7 ($0.6)	3.2%	(-$0.2, $1.7)	0.21
PY 2	$27	$27	$1.6*** ($0.5)	6.4%	($0.8, $2.4)	0.00	$27	$27	$2.1*** ($0.6)	8.5%	($1.1, $3.2)	0.00	$27	$27	$1.1 ($0.7)	4.1%	(-$0.1, $2.3)	0.15
PY 3	$31	$30	$2.4*** ($0.6)	8.6%	($1.5, $3.3)	0.00	$31	$30	$2.9*** ($0.7)	10.5%	($1.7, $4.1)	0.00	$31	$30	$1.9** ($0.8)	6.5%	($0.5, $3.3)	0.02
PY 4	$32	$31	$2.3*** ($0.6)	7.7%	($1.3, $3.3)	0.00	$32	$31	$3.2*** ($0.8)	10.8%	($1.8, $4.5)	0.00	$32	$31	$1.4 ($0.9)	4.7%	($0.0, $2.9)	0.10
PY 1 through 4	$29	$28	$1.9*** ($0.4)	7.0%	($1.2, $2.6)	0.00	$29	$28	$2.4*** ($0.6)	9.3%	($1.5, $3.4)	0.00	$29	$28	$1.3** ($0.6)	4.7%	($0.2, $2.3)	0.04

Table 5.A.1 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Durable medical equipment expenditures																		
Baseline	$22	$21	NA	NA	NA	NA	$22	$20	NA	NA	NA	NA	$22	$21	NA	NA	NA	NA
PY 1	$21	$19	$0.0 ($0.3)	0.1%	(-$0.4, $0.4)	0.97	$20	$19	-$0.2 ($0.3)	-1.2%	(-$0.8, $0.3)	0.46	$21	$20	$0.3 ($0.4)	1.4%	(-$0.4, $0.9)	0.45
PY 2	$23	$22	-$0.3 ($0.3)	-1.2%	(-$0.7, $0.2)	0.33	$22	$22	-$0.8** ($0.4)	-3.5%	(-$1.4, -$0.2)	0.03	$24	$23	$0.3 ($0.4)	1.3%	(-$0.4, $1.0)	0.48
PY 3	$24	$24	-$0.4 ($0.3)	-1.6%	(-$0.9, $0.1)	0.21	$24	$23	-$0.8* ($0.4)	-3.1%	(-$1.5, -$0.1)	0.06	$25	$24	$0.0 ($0.5)	0.1%	(-$0.7, $0.8)	0.96
PY 4	$26	$24	$0.1 ($0.4)	0.4%	(-$0.5, $0.7)	0.79	$25	$24	-$0.3 ($0.5)	-1.3%	(-$1.1, $0.4)	0.49	$26	$25	$0.4 ($0.5)	1.7%	(-$0.4, $1.3)	0.42
PY 1 through 4	$24	$23	-$0.1 ($0.3)	-0.6%	(-$0.6, $0.3)	0.58	$23	$22	-$0.5 ($0.3)	-2.3%	(-$1.1, $0.0)	0.12	$24	$23	$0.3 ($0.4)	1.1%	(-$0.4, $0.9)	0.53
Unweighted sample sizes[k]																		
Number of practices	1,373	5,243					738	2,979					635	2,264				
Number of beneficiaries	1,446,195	4,935,793					742,582	2,882,949					706,113	2,067,467				
Number of beneficiary-years	4,862,194	16,407,527					2,482,081	9,565,553					2,380,113	6,841,974				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] We report the actual, unadjusted averages in the baseline period which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics and practice fixed effects.

[c] We calculated percentage impacts relative to what the CPC+ mean would have been in Program Years 1 through 4 (separately and combined) in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Expenditures for Part A and Part B services in PY 3 and PY 4 include QPP payment adjustments, based on practitioner performance two years before. They are applicable for both CPC+ and comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims); and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on 2018 and 2019 claims for these practitioners, respectively). The first QPP adjustments were paid in PY 3 (two years after the start of QPP), so there are no QPP payments in PYs 1 and 2.

[e] We determine SSP ACO participation status based on participation at the beginning of PY 1 (January 1, 2017). However, over time, CPC+ practices may join or leave SSP, resulting in a small subset of SSP practices receiving the Performance-based Incentive Payments and a small subset of non-SSP practices receiving the shared savings payments. This is reflected in the impact estimates.

[f] The sum of expenditures by service category does not equal the total expenditures for Part A and B services without enhanced payments in PY 3 and PY 4 because the total expenditures include lump-sum incentive payments that are not applied at the claim level and are instead paid out directly to eligible practitioners who participated in Advanced APMs in 2017 and 2018.

Table 5.A.1 *(continued)*

[g] Acute inpatient care includes short-stay acute hospital admissions and admissions to CAHs. Expenditures for non-acute hospital admissions other than those for inpatient rehabilitation, such as psychiatric hospital admissions, are included in inpatient expenditures but not shown separately.

[h] Expenditures, with QPP payment adjustments, on outpatient ED visits include professional (which is part of expenditures for physician and nonphysician Part B noninstitutional services) and facility fees, as well as payments for observation stays.

[i] Expenditures, with QPP payment adjustments, on Part B noninstitutional services include expenditures for (1) ambulatory primary care visits, (2) ambulatory specialist visits, and (3) non-ambulatory physician visits as well as services provided by other noninstitutional providers. (We only show the first two categories separately in the table).

[j] We define the assigned practice for the baseline period as the first practice to which a beneficiary was attributed during the baseline period, and the assigned practice for the intervention period as the first practice that the beneficiary was attributed to during the intervention period.

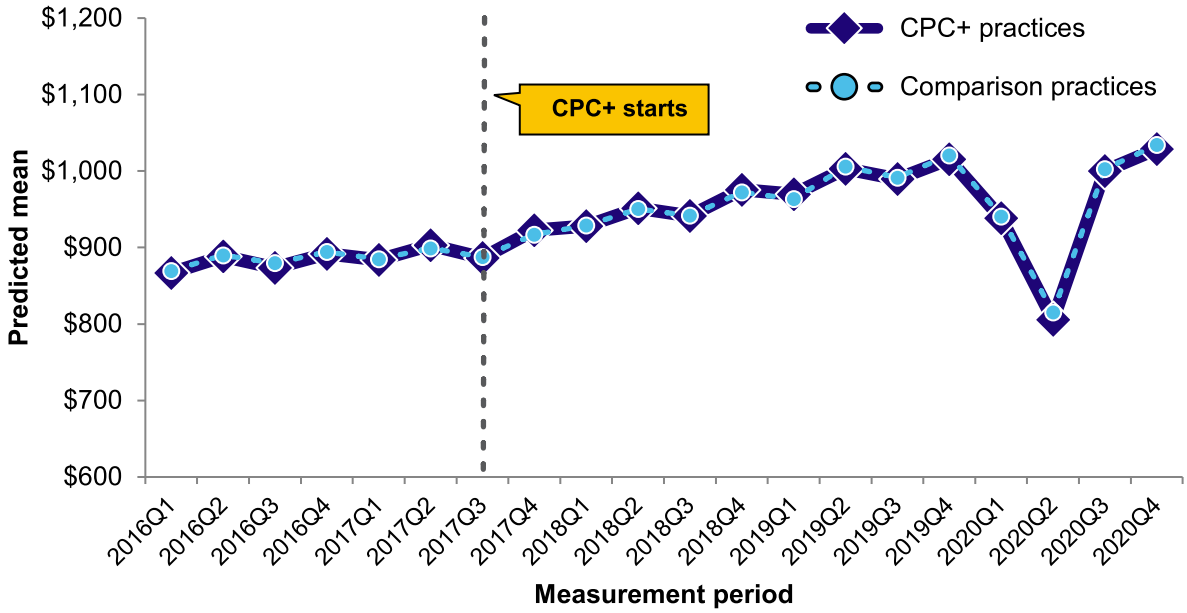
[k] After accounting for weights that adjust for matching and time observed in Medicare FFS, the effective sample sizes fall but are still substantial. For the comparison group, the effective sample size is 43 to 50 percent of the actual sample size. The effective sample size for the CPC+ group is about 96 percent of the actual sample size because it is affected only by time observed (and not by the matching weights).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

NA = not applicable because the difference-in-differences impact estimate cannot be calculated at baseline.

ACO = Accountable Care Organization; APM = Alternative Payment Model; C = comparison; CAH = critical access hospital; FFS = fee-for-service; MIPS = Merit-based Incentive Payment System; PY = Program Year; QPP = Quality Payment Program; SE = standard error; SSP = Medicare Shared Savings Program.

Figure 5.A.1. Quarterly trends in average Medicare expenditures PBPM, excluding CMS's enhanced payments, Track 1



Source: Analyses of Medicare claims data from January 2013 through December 2020.

Notes: For beneficiaries attributed to CPC+ and comparison practices, the figure shows actual, unadjusted average expenditures in the baseline quarters (Q1 through Q4 of 2016), which are similar for the two groups due to matching. In the intervention quarters (starting in Q1 2017), the comparison group mean is regression-adjusted based on the quarterly difference-in-differences model, which adjusts for baseline characteristics. The sharp decline in expenditures during the first and second quarters of 2020 can be attributed to a decline in the overall utilization of health services during the initial months of the COVID-19 pandemic.

PBPM = per beneficiary per month.

Impacts on expenditures significantly diverged in Program Year (PY) 3 and PY 4 for Track 1 practices participating in Medicare's Shared Savings Program (SSP) at baseline. In PY 1 and PY 2, the estimated impacts on expenditures without CMS's enhanced payments among both SSP and non-SSP practices were less than or equal to 1 percent and were not statistically significant. However, in PYs 3 and 4, there were statistically significantly different but opposing estimated effects on expenditures by SSP status ($p < 0.01$ for the difference by SSP subgroup). Specifically:

- **Practices in SSP Track 1 began to generate gross savings in PY 4.** SSP practices had a 1.5 percent relative decrease in expenditures without CMS enhanced payments (-$14.9 PBPM, $p = 0.02$) in PY 4. As described in Section A.2 of this Appendix, this reduction was driven by a relative decline in expenditures for acute inpatient services, with a corresponding decline in acute hospitalizations. This reduction suggests that there could be favorable interactions in the incentives and supports provided by CPC+ and SSP programs.
- **For non-SSP Track 1 practices, increases in expenditures emerged in PY 3 and continued through PY 4**. Non-SSP practices had relative increases of $13.2 PBPM (1.4 percent, $p = 0.03$) in PY 3 and $11.0 PBPM (1.2 percent, $p = 0.09$) in PY 4. These were driven primarily by increases in three expenditure categories: physician and non-physician

Part B noninstitutional services, inpatient rehabilitation facilities, and outpatient services (in PY 3 only), as described in Section A.2.

- While the triple-differences estimates for expenditures were not statistically significant for either SSP practices or non-SSP practices and did not significantly differ by SSP subgroup, they also show relatively more favorable point estimates and confidence intervals for SSP practices compared to non-SSP practices, especially in PYs 3 and 4 (see Appendix 5.G for more details). The DD estimates for these SSP-participation based subgroups were also within the 90 percent confidence intervals of the DDD estimates.

A.2. Medicare expenditures by service category

Over the first four years, CPC+ reduced expenditures on some services, but this did not translate into reductions in overall expenditures, due to offsetting increases in other expenditure categories. CPC+ reduced expenditures for acute inpatient and home health services by about $3 PBPM and $1 PBPM, respectively; however, this reduction was offset by increases of about $2 PBPM each in physician and nonphysician Part B noninstitutional services and hospice and an increase of about $1 PBPM for inpatient rehabilitation facilities. Specifically, CPC+ reduced expenditures on:

- **Acute inpatient services. Expenditures for acute inpatient care decreased by about 2 percent in PYs 3 and 4 due to decreases among SSP practices.** The relative decreases of $4.6 PBPM (-1.5 percent, $p = 0.04$) and $6.7 PBPM (-2.4 percent, $p < 0.01$) in expenditures for acute inpatient care in PYs 3 and 4, respectively, across all Track 1 practices were driven by a relative decline for CPC+ practices within the SSP group (-$8.3 PBPM,-2.7 percent, $p < 0.01$ in PY 3 and -$12.5 PBPM, -4.2 percent, $p < 0.01$ in PY 4). There were no effects among the non-SSP practices and the differences by SSP subgroup were statistically significant ($p = 0.07$ in PY 3 and $p = 0.01$ in PY 4 for the difference by SSP subgroup). This is consistent with reductions in acute hospitalizations experienced by Track 1 SSP practices but not Track 1 non-SSP practices (see Section B for more details).
- **Home health. Track 1 was also associated with a 3 percent relative decrease in home health expenditures relative to comparison practices.** Although we did not have a clear hypothesis for the direction of change in home health expenditures, there was a 3.0 percent average annual relative decrease in home health expenditures (-$1.2 PBPM, $p < 0.01$) that first emerged in PY 2 and continued through PY 4. The estimated effects on home health expenditures were similar by SSP status over the first four years.

CPC+ increased expenditures on:

- **Physician and nonphysician Part B noninstitutional services. In PY 3 and PY 4, there were 1 percent relative increases in expenditures for physician and nonphysician Part B noninstitutional services in Track 1, driven by increases among non-SSP practices.** There were increases of $2.6 PBPM (0.9 percent, $p = 0.03$) and $3.2 PBPM (1.2 percent, $p = 0.02$) in expenditures on physician and nonphysician Part B noninstitutional services in PYs 3 and 4, respectively, in Track 1, which were driven by the statistically significant estimates in the non-SSP group ($4.1 PBPM or 1.5 percent [$p = 0.03$] in PY 3 and $5.6 PBPM or 2.2 percent [$p < 0.01$] in PY 4). Estimates in the SSP group were less than 0.5 percent and not statistically

significant, and the differences by SSP status were on the margin of statistical significance (p = 0.10 for the difference by SSP subgroup).

- **Hospice. Expenditures for hospice services increased by 6 percent more for Track 1 practices than for comparison practices.** For both Track 1 practices and comparison practices, hospice expenditures increased during the first four years of CPC+, but hospice expenditures increased by $1.9 PBPM (6.7 percent, $p < 0.01$; Table 5.A.1]) more among Track 1 practices. The estimated impacts increased from $1.1 PBPM ($p < 0.01$) in PY 1 to over $2 PBPM in PY 3 and PY 4 (Table 5.A.1). Estimated increases in hospice expenditures were similar by SSP status. The relative increase in hospice expenditures was driven by a relative increase in both the proportion of beneficiaries receiving hospice services and the length of hospice stay among those beneficiaries receiving hospice services; see Section 5.A.1, Subsection C.3 for further discussion.
- **Inpatient rehabilitation facilities. Over the four years, Track 1 was associated with a 5 percent increase in inpatient rehabilitation facility expenditures relative to comparison practices.** Although we did not have a clear hypothesis for the direction of change in inpatient rehabilitation facility expenditures (a subset of inpatient expenditures), there was a relative increase in inpatient rehabilitation facility expenditures of about 5 percent, which was consistently observed across the years (with the annual estimates ranging from $0.8 PBPM [3.8 percent, $p = 0.07$] to $1.5 PBPM [7.1 percent, $p < 0.01$]). The relative increase in inpatient rehabilitation facility expenditures was concentrated among non-SSP practices ($2.0 PBPM [9.5 percent, $p < 0.01$] versus $0.4 PBPM [1.9 percent, $p = 0.45$] for SSP practices), with a statistically significant difference by SSP status ($p = 0.05$ for the difference by SSP subgroup).

There were no discernible effects on outpatient, skilled nursing facility, or durable medical equipment expenditures for Track 1 practices over the first four years. Average annual estimates in these expenditure categories were 1 percent or less, less than $1 PBPM, and not statistically significant. However, there was a relative increase in outpatient expenditures for Track 1 non-SSP practices in PY 3 ($3.6 PBPM, 1.7 percent, $p = 0.08$).

A.3. Medicare expenditures including CMS's enhanced payments (care management fees [CMFs], performance-based incentive payments [PBIPs], and SSP payments)

After including all of CMS's enhanced payments, Medicare expenditures increased by $14.1 PBPM (similar to the total enhanced payments PBPM) or 1.5 percent ($p < 0.01$) more for Track 1 practices than for comparison practices over the first four program years (Table 5.A.1). CMS's enhanced payments included payments for participation in CPC+ and for performance. We arrived at this estimate by completing the following steps to account for the various payments:

- We first included payments for practices' participation in CPC+—that is, CMFs for practices in Track 1. We found that, after including CMFs, Medicare expenditures increased by $14.0 PBPM ($p < 0.01$) more for Track 1 practices than for the comparison practices over the first four program years, which translates to an increase of 1.5 percent (Table 5.A.1). These estimates differed significantly by SSP subgroup ($p = 0.02$ for the difference by SSP subgroup) with only non-SSP Track 1 practices experiencing significant increases relative to the comparison group ($21.9 PBPM, 2.4 percent, $p < 0.01$ for non-SSP practices versus $6.4

PBPM, 0.7 percent, $p = 0.14$ for SSP practices). The average CMFs across the four years were very similar for SSP and non-SSP practices ($12.3 PBPM for SSP practices and $12.2 PBPM for the non-SSP practices), so this difference in Medicare expenditures is explained by the differences in impacts on expenditures without enhanced payments in the two groups.

- Next, we included payments for participation (as described above) *and* for performance. Payments for performance included: (1) PBIPs, which only CPC+ non-SSP practices received during the intervention years; and (2) SSP Accountable Care Organization (ACO) shared savings payments—which were received by ACOs to which CPC+ and comparison SSP practices belonged to—and were received in both baseline and intervention years (because SSP existed before and during CPC+).
  - *Non-SSP practices.* After adding in the PBIPs (in addition to the CMFs) that non-SSP CPC+ practices received in the four intervention years, the relative increase in Medicare expenditures for the non-SSP group increased by $0.6 PBPM—from $21.9 PBPM (2.4 percent, $p < 0.01$) without PBIPs to $22.5 PBPM (2.5 percent, $p < 0.01$) with PBIPs.[21]
  - *SSP practices.* Adding in the share of ACO SSP payments that we assigned to beneficiaries in CPC+ and comparison SSP practices in Track 1 (in addition to the CMFs) decreased the non-statistically significant estimate for the SSP group by $0.2 PBPM—from $6.4 PBPM (0.7 percent, $p = 0.14$) without PBIPs to $6.2 PBPM (0.6 percent, $p = 0.15$) with PBIPs.[22] This small relative decrease was driven by a differential increase in the average PBPM shared savings payments we assigned to CPC+ Track 1 SSP beneficiaries versus those assigned to comparison beneficiaries from baseline through the intervention period. Specifically, during the baseline year and throughout the four-year intervention period, the average SSP payments assigned to CPC+ Track 1 SSP beneficiaries increased from $4.4 PBPM to an average of $7.1 PBPM; however, during the same period, that payment increased from $3.8 PBPM to $7.3 PBPM for comparison SSP beneficiaries.[23]

[21] The impact estimate of $22.5 PBPM for Track 1 practices in the non-SSP subgroup includes both PBIPs and shared savings payments. Over time, CPC+ practices may join or leave the SSP, resulting in a small subset of non-SSP practices receiving shared savings payments. From baseline through the intervention period, the change in PBIPs was $1.3 PBPM higher for CPC+ Track 1 non-SSP practices than for comparison practices. However, the change in shared savings payments was $0.7 PBPM lower for CPC+ Track 1 non-SSP practices than for comparison practices. As a result, the overall increase in the impact estimate was $0.6 PBPM.

[22] The impact estimate of $6.2 PBPM for Track 1 practices in the SSP subgroup includes both PBIPs and shared savings payments. Over time, CPC+ practices may join or leave the SSP, resulting in a small subset of SSP practices receiving PBIPs. From baseline through the intervention period, the change in PBIPs was $0.3 PBPM higher for CPC+ Track 1 SSP practices than for comparison practices. However, the change in shared savings payments was $0.5 PBPM lower for CPC+ Track 1 SSP practices than for comparison practices. As a result, the overall decrease in the impact estimate was $0.2 PBPM.

[23] In PY 1 through PY 3, CPC+ Track 1 SSP practices had about $1 PBPM higher ACO SSP payments than comparison practices; however, in PY 4 CPC+ Track 1 SSP practices had $3 PBPM lower ACO SSP payments than comparison practices. Across the four intervention years, this averaged to $0.2 lower ACO SSP payments for CPC+ Track 1 SSP practices. Differences in ACO SSP payment patterns in PY 4 could be explained by the Medicare SSP Extreme and Uncontrollable Circumstances policy, which reduced completely any shared losses an ACO incurred in 2020.

A.4. Results of sensitivity tests for impact estimates on Medicare expenditures without CMS's enhanced payments

Results from sensitivity tests were mostly similar to those from our main model, in that they all suggested that over the four years, the effect on Medicare expenditures without CMS's enhanced payments (our primary outcome) in Track 1, was close to zero; while some estimates suggested expenditures increased, the estimated increases were always less than 1 percent. These results suggest that our main findings ($1.8 PBPM, 0.2 percent, $p = 0.58$) are robust to (1) changes in the empirical estimation strategy (including the length of the baseline period, the composition of the analysis sample, the model specification, the set of control variables, and the definition of counterfactual), (2) changes in the measure definition, and (3) are unlikely to be biased due to COVID-19.

Tables 5.A.2 and 5.A.3 show the results from these tests together with the motivation behind each of them.

Two sensitivity tests that changed the key elements of our estimation approach indicated small (less than 1 percent) but statistically significant increases in expenditures.

- When we altered the sample to include only beneficiaries who were attributed during the first quarter of the baseline and intervention periods, the impact estimate was $6.6 PBPM (0.7 percent, $p = 0.05$).[24]
- When we used log expenditures as the dependent variable, the impact estimate was 0.8 percent ($p = 0.03$).

We found comparable results when we used an alternate definition of Medicare expenditures without CMS's enhanced payments, which excludes the QPP payment adjustments. Because QPP payment adjustments were small ($2.2 PBPM for CPC+ Track 1 practices in both PY 3 and PY 4, and $1.6 and $1.8 PBPM, respectively, for comparison practices[25]), the estimates for expenditures without the QPP payments were similar to the estimates for our primary expenditure outcome, which includes the QPP payments in PY 3 and PY 4 (PY 4 estimates are shown in Table 5.A.3).

Findings from the two COVID-19-specific sensitivity analyses also produced similar estimates to our main model, suggesting that the likelihood of any bias in our estimates from

[24] This statistically significant estimate is slightly higher than our main estimate of $1.8 PBPM ($p = 0.58$), which could suggest differential changes in sample composition in the CPC+ and comparison groups over time. However, at this point, we are not very concerned about differential changes in sample composition biasing our estimates because (1) the estimate from this test, while statistically significant, represents a change in expenditures of less than 1 percent; (2) out of the six (three for each track) tests (listed in Table 5.A.2) conducted for changes in sample composition, only one test yielded a statistically significant finding; and (3) an examination of descriptive statistics on key characteristics (race, gender, disability, dual eligibility status, HCC score, and chronic conditions) of assigned beneficiaries did not suggest any systematic differences between beneficiaries assigned to CPC+ and comparison practices over time.

[25] CPC+ Track 1 practices had slightly higher average QPP payments because more Track 1 practitioners participate in QPP through the Advanced APM track and earn a 5 percent lump sum bonus (for participating in an advanced APM). More comparison practitioners participate through the MIPS track, where the payment adjustment could be upwards or downwards and the maximum upward payment adjustment in PY 4 is under 2 percent.

COVID-19 during PY 4 might be minimal. The point estimates for expenditures from the main analysis were within the 90 percent confidence interval around the triple-differences estimates in PY 4, both overall (Table 5.A.3) and by SSP status (see Appendix 5.G for more details on the triple-differences analysis).

Table 5.A.2. Estimates of the four-year impact of CPC+ on Medicare expenditures without CMS's enhanced payments for Track 1, from main analysis and sensitivity tests

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Main analysis (cumulative estimate across four years)	**Uses a difference-in-differences analysis with an ITT beneficiary sample, a one-year baseline period, controls for baseline beneficiary characteristics, COVID-19-related controls, and practice fixed effects**	**$1.8**	**0.2%**	0.58	**-$3.5**	**$7.0**
Altering length of baseline period						
Use two-year baseline period (instead of one year) [a]	Controls for outcome levels over longer pre-CPC+ period	$3.2	0.3%	0.27	-$1.6	$7.9
Altering the composition of the beneficiary sample						
Use sample of beneficiaries attributed during both the baseline and intervention periods as the analysis sample [b]	Helps to adjust for changes in sample composition between baseline and follow-up that may differ for the intervention and matched comparison groups	$1.3	0.1%	0.69	-$4.1	$6.8
Examine the impacts for the subset of beneficiaries attributed in the first quarter of the baseline period and the intervention period [c]	Removes any effects that may be due to changes in sample composition over time, for both baseline and intervention years	$6.6**	0.7%	0.05	$1.2	$12.1
Instead of following an ITT approach to defining the beneficiary sample (once attributed, beneficiaries stay in the sample for all subsequent years), allow beneficiaries to drop out of the sample if they no longer meet attribution requirements [d, e]	Assesses whether ITT tends to attenuate true effects by retaining beneficiaries in the intervention group who are no longer seen by CPC+ practices	$1.8	0.2%	0.56	-$3.3	$7.0

Table 5.A.2 *(continued)*

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Altering the modeling assumptions						
Use generalized linear model with log link	Handles skewed expenditure distribution	-$1.4	-0.1%	0.81	-$10.8	$8.0
Trim expenditures at 98th percentile	Reduces influence of beneficiaries with high outlier expenditures	$0.4	0.0%	0.87	-$3.6	$4.4
Use log expenditures [f]	Reduces influence of beneficiaries with high outlier expenditures	NA	0.8%**	0.03	0.2%	1.3%
Controlling for contemporaneous SSP participation						
Use a model that controls for contemporaneous (same year) SSP participation status	Controls for changes in SSP participation status among CPC+ and comparison practices over time	$2.4	0.3%	0.45	-$2.9	$7.7
Alternative definition of counterfactual						
Use a triple differences approach [g]	Controls for regional differences in trends among CPC+ and comparison practices	$5.9	0.6%	0.21	-$1.8	$13.6

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

[a] Sample size is 17 percent larger than the main analysis.

[b] Sample size is about 31 percent smaller than the main analysis.

[c] Sample size is about 28 percent smaller than the main analysis.

[d] Sample size is about 9 percent smaller than the main analysis.

[e] The percentage of beneficiaries that are no longer attributed to CPC+ or comparison practices but are still included in the research sample due to the ITT approach grows over time; however, the yearly estimate from this sensitivity test was similar to the corresponding estimate from the main analysis in PY 4 (-$3.1 [$p$ = 0.51] and -$2.0 [$p$ = 0.66], respectively).

[f] We obtained only a percentage impact, not a dollar impact, from the model specification with log of expenditures as the outcome. The dollar magnitude of the impact in this model depends on the starting value—for example, a 0.8 percent impact for someone with expenditures equal to the CPC+ mean during the intervention period would be about $7.6.

[g] Sample size is 234 percent larger than the main analysis (because the triple-differences model also includes non-participating practices in CPC+ regions and unselected practices in comparison regions).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CI = confidence interval; ITT = intent-to-treat; SSP = Medicare Shared Savings Program.

Table 5.A.3. Estimates of the PY 4 impact of CPC+ on Medicare expenditures without CMS's enhanced payments for Track 1, from main analysis and sensitivity tests

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Main analysis (PY 4 estimate)	**Uses a difference-in-differences analysis with an ITT beneficiary sample, a one-year baseline period, controls for baseline beneficiary characteristics, COVID-19-related controls, and practice fixed effects**	**-$2.0**	**-0.2%**	**0.66**	**-$9.4**	**$5.4**
Altering the definition of the outcome (PY 4 estimate)						
Use expenditures that exclude the QPP payments	Tests whether estimates are sensitive to an alternative definition of the outcome	-$2.4	-0.3%	0.59	-$9.8	$5.0
COVID-19 specific sensitivity tests (PY 4 estimate)						
Estimate obtained through a triple differences approach [a]	Controls for regional differences in trends due to COVID-19 among CPC+ and comparison practices	$0.6	0.1%	0.92	-$10.2	$11.5
Estimate for expenditure outcome constructed by dropping claims from March 2020 to May 2020 [b]	Tests for the sensitivity of the estimate to changes in expenditures during peak COVID-19 period	$0.1	0.0%	0.97	-$7.5	$7.8

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

[a] Sample size is 234 percent larger than the main analysis (because the triple-differences model also includes non-participating practices in CPC+ regions and unselected practices in comparison regions).

[b] Sample size is about 0.01 percent smaller than the main analysis.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CI = confidence interval; ITT = intent-to-treat; PY = Program Year.

A.5. Impact estimates on Medicare expenditures without CMS's enhanced payments for practice and patient subgroups

While our primary design includes separate analyses for SSP and non-SSP practices, for the primary expenditure outcome, we also examined subgroup effects separately for certain *subgroups of practices* and *subgroups of beneficiaries.* (These subgroups were designated in advance in the evaluation design report [Peikes et al. 2018b] and are described in Appendix 5.E) To account for correlation in practice characteristics, we estimated a single regression that included all practice subgroup interaction terms. This means that the impact estimates (described below) are the effects of being in a certain practice subgroup while controlling for other practice characteristics. We first tested whether the impact estimates for the subgroups defined by the same characteristic were significantly different from one another, using a t-test for subgroups with two categories (for example, hospital- or system-owned and independent practices) and using an F-test for subgroups with more than two categories (for example, small, medium, and large practices). The last column of Table 5.A.4 and Table 5.A.5 shows the *p*-values from this test. If we found significant differences across subgroups defined by a particular characteristic, we then tested whether the impact estimate within a subgroup was significantly different from zero.

A.5.1. Findings from practice subgroup analysis

For Track 1, the estimated annual average effect on Medicare expenditures across the four years did not vary across practice subgroups. The evidence for statistically significant variation in impact estimates on Medicare expenditures by practice characteristics was weak (Table 5.A.4).

- We conducted an F-test where the null hypothesis was that the estimated impact of CPC+ Track 1 is the same across all practice subgroups (i.e., the coefficients of the triple interaction terms of the treatment indicator, intervention period indicator, and the practice subgroup indicator were equal to zero). With the *p*-value of 0.44 for this test, we could not reject the null hypothesis, meaning that we do not have strong evidence for variation in estimates across practice subgroups.
- There were also no notable differences in estimated impacts between subgroups defined by the same practice characteristics such as practice size and hospital/system ownership in Track 1.

Table 5.A.4. Estimates of four-year impact of CPC+ on Medicare expenditures without CMS's enhanced payments, by baseline practice characteristics for Track 1

Practice subgroup definition, based on baseline characteristics	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	Percentage impact	*p*-Value for difference in impact estimates between subgroups[a]
Main analysis (all practices)	-	**$1.8 ($3.2)**	**0.2%**	-
Whether practice participated in prior primary care transformation initiatives (recognized as a medical home or participated in MAPCP or CPC Classic)				
Yes	468,562 (53.6%)	$3.1 ($4.5)	0.3%	
No	405,431 (46.4%)	-$0.2 ($4.5)	0.0%	0.57
Large and medium versus small practice based on number of primary care practitioners				
Large (6+ primary care practitioners)	404,510 (46.3%)	-$3.2 ($4.7)	-0.3%	
Medium (3–5 primary care practitioners)	282,425 (32.3%)	$9.4 ($5.6)	1.0%	
Small (1–2 primary care practitioners)	187,058 (21.4%)	$0.0 ($6.9)	0.0%	0.12
Whether hospital- or system-owned versus independent				
Hospital- or system-owned	474,666 (54.3%)	$5.3 ($4.4)	0.6%	
Independent	399,328 (45.7%)	-$2.9 ($4.6)	-0.3%	0.25
Practice type: multi-specialty versus primary care only				
Multi-specialty	170,723 (19.5%)	$9.9 ($8.2)	1.1%	
Primary care only	703,270 (80.5%)	-$0.4 ($3.4)	0.0%	0.11
Urbanicity of practice's county: rural or suburban location versus urban location				
Rural	89,849 (10.3%)	$3.4 ($9.8)	0.4%	
Suburban	156,817 (17.9%)	$8.2 ($8.0)	0.9%	
Urban	627,328 (71.8%)	-$0.3 ($3.7)	0.0%	0.66

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: The estimates (and standard errors) in the impact estimate column show subgroup-specific impacts over the first four years of CPC+, separately, for each practice characteristic listed in the table. We only tested differences within each subgroup if the estimates were significantly different between the two subgroups (that is, the p-value in the last column was <.10). Asterisks denote whether the impact estimate within a subgroup was significantly different from zero when estimates were significantly different between the subgroup categories.

[a] The p-values in the last column represent results from testing for statistically significant differences in impact estimates between the subgroups, based on the baseline practice characteristic (using a t-test for subgroups with two categories and from an F-test for subgroups with more than two categories).

*/**/***Within-subgroup estimate significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CPC = Comprehensive Primary Care; MAPCP = Multi-payer Advanced Primary Care Practice Demonstration; SSP = Medicare Shared Savings Program.

A.5.2. Findings from beneficiary subgroup analysis

Across the four program years, Track 1 impact estimates for Medicare expenditures without CMS's enhanced payments did not differ by beneficiaries' baseline characteristics. There were no statistically significant differences between high-risk and non-high-risk beneficiary subgroups, regardless of whether high-risk beneficiaries were defined as (1) being in the top quartile of the HCC score distribution, (2) being in the top decile of the HCC score distribution or having dementia (which is how CMS defined risk tier 5 for Track 2 CPC+ practices), (3) having behavioral health conditions, (4) having 2 or more of 12 high-risk chronic conditions and a hospitalization at baseline (or in 2015 for observations in the baseline year), or (5) being dually eligible (Table 5.A.5). Note that most of the sample falls into the subgroup that is not high risk, so that the non-high-risk subgroup has more statistical power than the high-risk subgroup.

Table 5.A.5. Estimates of four-year impacts of CPC+ on Medicare expenditures without CMS's enhanced payments, by baseline beneficiary characteristics for Track 1

Beneficiary subgroup definition, based on baseline characteristics	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	Percentage impact	*p*-Value for difference in impact estimates between subgroups[a]
Main analysis (all beneficiaries)	**-**	**$1.8 ($3.2)**	**0.2%**	**-**
Patients in the highest quartile of the HCC score distribution				
Yes	203,846 (25.9)	-$3.3 ($9.6)	-0.2%	
No	583,247 (74.1)	$5.2 ($2.7)	0.8%	0.38
Patients in the highest decile of the HCC score distribution or who have dementia				
Yes	123,135 (15.6)	$2.9 ($13.2)	0.1%	
No	663,957 (84.4)	$2.6 ($2.9)	0.3%	0.98
Patients with selected behavioral health conditions (schizophrenia, depression or bipolar disorders, or drug or alcohol psychosis or dependence)				
Yes	68,832 (8.7)	-$11.1 ($12.5)	-0.8%	
No	718,261 (91.3)	$4.8 ($3.3)	0.5%	0.21
Patients with multiple chronic conditions (at least 2 of 12 frequently occurring chronic conditions[b]) and one or more hospitalizations[c]				
Yes	68,210 (8.7)	$8.2 ($18.7)	0.3%	
No	718,883 (91.3)	$2.7 ($3.0)	0.3%	0.77
Patients dually eligible for Medicare and Medicaid				
Yes	107,909 (12.6)	-$7.7 ($10.6)	-0.6%	
No	746,888 (87.4)	$2.7 ($3.2)	0.3%	0.34

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: Beneficiary characteristics to determine subgroup membership are measured at the start of the year-long baseline period for baseline observations and at the start of Program Year 1 for observations in the intervention period (Program Years 1 through 4). The estimates (and standard errors) in the impact estimate column show subgroup-specific impacts, separately for each beneficiary characteristic listed in the table. We only tested differences *within* each subgroup if the estimates were significantly different *between* the two subgroups (that is, the p-value in the last column was <.10). Asterisks denote whether the impact estimate *within* a subgroup was significantly different from zero when estimates were significantly different between the subgroup categories. Because we could not observe diagnoses (which are used to determine HCCs and calculate HCC scores) at baseline for beneficiaries who were new to Medicare during the program years, we excluded new Medicare beneficiaries from all subgroup analyses (except the analysis based on dual status since beneficiaries who are new to Medicare by definition could not have been enrolled in both Medicare and Medicaid prior to joining Medicare). Due to this process, about 10 percent of observations from the regressions were excluded for the subgroups defined by HCC score and chronic conditions. Therefore, the main impact estimate of $1.8 PBPM for Track 1 overall may not lie between the impact estimates for these subgroups.

[a] The p-values in the last column represent results from testing for statistically significant differences in impact estimates between the subgroups, based on the baseline beneficiary characteristic (using a t-test for all subgroups).

[b] The 12 frequently occurring chronic conditions are congestive heart failure, chronic obstructive pulmonary disease, history of acute myocardial infarction, ischemic heart disease, diabetes, metastatic cancer and acute leukemia, history of stroke, depression, dementia, atrial fibrillation, rheumatoid arthritis or osteoarthritis, and chronic kidney disease.

[c] For observations in the baseline year, hospitalizations are measured in 2015, the year before the start of the baseline year. For observations in the intervention period, hospitalizations are measured in 2016, the year before the start of Program Year 1.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

HCC = hierarchical condition category.

B. Medicare FFS service use

Acute hospitalizations. Over the first four program years, CPC+ reduced acute hospitalizations for Track 1 practices relative to comparison practices. Acute hospitalizations decreased for both CPC+ and comparison practices during the first four program years compared to the year before CPC+ began. The reduction was larger for Track 1 CPC+ practices, leading to an average annual relative decline of three visits per 1,000 beneficiaries (-0.9 percent, $p = 0.06$; Table 5.A.6). Consistent with the theory of change of CPC+, the reductions in hospitalizations took multiple years to realize, fully emerging in PY 4 with a reduction of five visits per 1,000 beneficiaries (-1.8 percent, $p = 0.01$). In line with this reduction in acute hospitalizations, there was a 1.8 percent ($p = 0.04$) relative reduction in expenditures for acute inpatient care in PY 4 (Table 5.A.1). There was some evidence for reductions in hospitalizations in PY 3, with estimates implying 1 percent reductions in acute hospitalizations that were on the margin of statistical significance ($p = 0.12$) along with statistically significant reductions in expenditures for acute inpatient care (-1.5 percent, $p = 0.04$). Estimated reductions in acute hospitalizations in PY 4 were larger for Track 1 SSP practices (-8.3 visits per 1,000 beneficiaries, $p < 0.01$) relative to Track 1 non-SSP practices (-1 visit per 1,000 beneficiaries, $p = 0.72$), and differences by SSP subgroup were statistically significant ($p = 0.04$ for the difference by SSP subgroup).

Emergency department (ED) visits. Over the first four program years, CPC+ reduced total and outpatient-specific ED visits for Track 1 practices relative to comparison practices. Total ED visits (which includes ED visits that lead to hospitalizations) decreased for both CPC+ Track 1 and comparison practices during the first four program years but decreased more for CPC+ Track 1 practices, leading to an average annual relative reduction of 13 ED visits per 1,000 beneficiaries (-1.9 percent, $p < 0.01$).

Outpatient ED visits, which constitute 70 percent of all ED visits, declined by eight visits per 1,000 beneficiaries (-1.8 percent, $p < 0.01$) more for Track 1 practices. Estimates (across the four years) for both total ED visits and outpatient ED visits were similar by SSP status. Consistent with the theory of change for CPC+, the reductions in ED visits emerged early, with reductions observed in the first program year. Notably, the reductions in outpatient ED visits did not translate into favorable declines in expenditures for outpatient ED visits (Table 5.A.1).

Primary care substitutable and potentially primary care preventable outpatient ED visits accounted for slightly over two-thirds of the overall reduction in outpatient ED visits, with average annual reductions of approximately four visits per 1,000 beneficiaries (-2.3 percent, $p < 0.01$) for primary care substitutable outpatient ED visits, and two visits per 1,000 beneficiaries (-1.6 percent, $p = 0.02$) for potentially primary care preventable outpatient ED visits.[26]

Results from sensitivity tests (not shown) suggest that changes in impact estimates for outpatient ED visits and hospitalizations in PY 4 should not necessarily be interpreted as a trend toward increasingly favorable reductions. While the estimated reductions in outpatient

[26] The relative reductions of 4.0 primary care substitutable outpatient ED visits and 1.9 potentially primary care preventable outpatient ED visits accounted for 71 percent of the 8.3 visit reduction in all outpatient ED visits ([4.0 + 1.9] / 8.3 = 71 percent).

ED visits and hospitalizations in PY 4 appear to be larger than the corresponding estimates in PY 3 (Table 5.A.6), this should not necessarily be interpreted as an increasingly favorable trend, for two reasons:

- The PY 4 estimates for outpatient ED visits and hospitalizations are not statistically different from the PY 3 estimates for these outcomes at the 10 percent level of significance, suggesting that the larger estimates in PY 4 may be due just to chance.
- Triple-differences models estimated smaller impacts for outpatient ED visits and hospitalizations in PY 4 (Appendix 5.G), and the difference-in-differences estimate for hospitalizations in PY 4 was larger than the highest reduction implied by the 90 percent confidence interval around the triple-differences estimate, so it is possible that the difference-in-differences models could be overestimating the magnitude of the impacts in PY 4.

We found no evidence that differential health care avoidance during the initial months of the COVID-19 pandemic led to a bias in the PY 4 estimates for outpatient ED visits and hospitalizations in Track 1. Results from a sensitivity test that dropped claims from the peak period of COVID-19's impact on health care utilization (March through May 2020), yielded estimates of a similar magnitude for outpatient ED visits and hospitalizations in PY 4 as our main analysis, suggesting that differential health care avoidance in the first three months of the pandemic was unlikely to bias these impact estimates in PY 4.

Urgent care visits. An effect on urgent care visits emerged for the first time in PY 4; however, this may have been driven partially by a response to the COVID-19 pandemic rather than by a CPC+ effect. In PY 4, Track 1 CPC+ practices experienced a relative increase in urgent care visits of 20 visits per 1,000 beneficiaries (15 percent, $p < 0.01$). This relative increase in PY 4 contributed to an average annual relative increase in urgent care visits of 6 visits per 1,000 beneficiaries (4.8 percent, $p = 0.02$) across the four program years. However, these findings should be interpreted cautiously because the triple-differences estimate did not indicate any effects of CPC+ Track 1 on urgent care visits in PY 4, and the difference-in-differences estimate was larger than the greatest increase implied by the 90 percent confidence interval around the triple-differences estimate. Between PY 3 and PY 4, urgent care visit rates declined among comparison practices while remaining relatively stable for CPC+ Track 1 practices; however, we observed the same relatively stable trend for practices in CPC+ regions that did not participate in CPC+. This suggests that COVID-19 shocks or other regional trends might explain the relative increases in urgent care visits in PY 4.

Ambulatory care visits. CPC+ did not have any discernible effects on the number of ambulatory primary care and ambulatory specialty care visits for Track 1 practices during the first four program years. The differences between Track 1 and the comparison practices for each outcome were less than 1 percent and were not statistically significant. However, in PY 4, there was some divergence by SSP status for ambulatory specialist visits—with a 1 percent (-43.3 visits per 1,000 beneficiaries. $p = 0.05$) reduction in the Track 1 SSP group and a 1.5 percent increase (51.5 visits per 1,000 beneficiaries, $p = 0.03$) in the Track 1 non-SSP group ($p < 0.01$ for the difference by SSP subgroup).

Telehealth visits. Beneficiaries in Track 1 CPC+ practices experienced a greater shift toward telehealth (i.e., non-face-to-face visits) than beneficiaries in comparison practices in PY 4. Before the COVID-19 pandemic, less than 0.2 percent of ambulatory visits were not face-to-face. However, in PY 4, 15.7 percent of all ambulatory primary care visits for CPC+ Track 1 practices were not face-to-face; for comparison practices, the regression-adjusted rate was 14.8 percent (a 0.9 percentage point difference, $p < 0.01$) (Table 5.A.7). Similarly, in PY 4, 11.4 percent of all ambulatory visits to specialists were not face-to-face, 0.3 percentage points higher than the corresponding regression-adjusted percentage for comparison practices in PY 4 ($p = 0.04$). Expenditures on non-face-to-face visits followed pattern similar to that for non-face-to-face visits (Table 5.A.7). Estimated increases in telehealth visits and expenditures were larger for Track 1 non-SSP practices, and differences by SSP status were statistically significant for specialist visits and expenditures ($p = 0.01$ for the difference by SSP subgroup for both primary care visits and expenditures).

Table 5.A.6. Regression-adjusted means and estimated impact of CPC+ on selected Medicare service use outcomes for attributed Medicare FFS beneficiaries over the first four program years, Track 1

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
Service use (per 1,000 beneficiaries per year)																		
Acute hospitalizations (short-stay acute care and critical access hospitals)																		
Baseline	290	289	NA	NA	NA	NA	291	289	NA	NA	NA	NA	289	288	NA	NA	NA	NA
PY 1	289	288	-0.7 (1.5)	-0.2%	(-3.2, 1.8)	0.64	289	290	-2.7 (1.9)	-0.9%	(-5.9, 0.4)	0.15	289	286	1.5 (2.4)	0.5%	(-2.5, 5.4)	0.54
PY 2	285	285	-2.0 (1.6)	-0.7%	(-4.7, 0.7)	0.23	286	287	-2.3 (2.1)	-0.8%	(-5.8, 1.2)	0.28	283	283	-1.6 (2.5)	-0.6%	(-5.8, 2.6)	0.53
PY 3	284	286	-2.7 (1.8)	-1.0%	(-5.6, 0.2)	0.12	286	289	-5.1** (2.2)	-1.7%	(-8.8, -1.4)	0.02	283	282	-0.1 (2.8)	0.0%	(-4.6, 4.5)	0.98
PY 4	243	246	-4.5** (1.8)	-1.8%	(-7.5, -1.6)	0.01	244	251	-8.3*** (2.3)	-3.3%	(-12.2, -4.5)	0.00	242	242	-1.0 (2.7)	-0.4%	(-5.4, 3.5)	0.72
PY 1 through 4	274	276	-2.6* (1.4)	-0.9%	(-5.0, -0.3)	0.06	276	279	-4.7*** (1.8)	-1.7%	(-7.6, -1.7)	0.01	273	273	-0.5 (2.2)	-0.2%	(-4.1, 3.2)	0.84
Total ED visits, including observation stays[d]																		
Baseline	711	709	NA	NA	NA	NA	698	696	NA	NA	NA	NA	725	724	NA	NA	NA	NA
PY 1	708	713	-6.8** (2.8)	-1.0%	(-11.5, -2.1)	0.02	696	701	-7.6** (3.8)	-1.1%	(-13.8, -1.5)	0.04	721	726	-5.7 (4.3)	-0.8%	(-12.8, 1.3)	0.18
PY 2	700	710	-11.1*** (3.2)	-1.6%	(-16.3, -5.9)	0.00	688	696	-10.9*** (4.2)	-1.6%	(-17.9, -4.0)	0.01	713	724	-11.1** (4.7)	-1.5%	(-18.9, -3.4)	0.02
PY 3	700	713	-14.5*** (3.5)	-2.0%	(-20.3, -8.8)	0.00	689	702	-15.0*** (4.5)	-2.1%	(-22.4, -7.7)	0.00	711	725	-13.8** (5.4)	-1.9%	(-22.7, -5.0)	0.01
PY 4	567	584	-18.7*** (3.8)	-3.2%	(-25.0, -12.4)	0.00	556	576	-22.5*** (5.2)	-3.9%	(-31.1, -14.0)	0.00	578	592	-13.6** (5.9)	-2.3%	(-23.2, -3.9)	0.02
PY 1 through 4	666	678	-13.1*** (2.9)	-1.9%	(-17.8, -8.4)	0.00	655	667	-14.2*** (3.8)	-2.1%	(-20.4, -7.9)	0.00	678	689	-11.5*** (4.3)	-1.7%	(-18.5, -4.4)	0.01
Outpatient ED visits, including observation stays																		
Baseline	493	498	NA	NA	NA	NA	476	480	NA	NA	NA	NA	510	518	NA	NA	NA	NA
PY 1	490	501	-5.5** (2.3)	-1.1%	(-9.3, -1.8)	0.02	475	484	-5.5* (3.0)	-1.1%	(-10.4, -0.6)	0.07	506	520	-5.3 (3.5)	-1.0%	(-11.0, 0.4)	0.12
PY 2	484	497	-7.3*** (2.6)	-1.5%	(-11.7, -3.0)	0.01	467	479	-8.0** (3.5)	-1.7%	(-13.8, -2.3)	0.02	502	516	-6.5* (4.0)	-1.3%	(-13.1, 0.0)	0.10
PY 3	484	498	-8.3*** (2.9)	-1.7%	(-13.0, -3.6)	0.00	469	480	-7.5** (3.6)	-1.6%	(-13.5, -1.5)	0.04	500	517	-9.1** (4.5)	-1.8%	(-16.5, -1.8)	0.04
PY 4	376	393	-11.3*** (3.3)	-2.9%	(-16.8, -5.9)	0.00	360	377	-14.3*** (4.5)	-3.8%	(-21.6, -6.9)	0.00	393	408	-6.8 (5.1)	-1.7%	(-15.1, 1.5)	0.18
PY 1 through 4	456	470	-8.3*** (2.4)	-1.8%	(-12.2, -4.4)	0.00	441	453	-9.0*** (3.2)	-2.0%	(-14.2, -3.7)	0.00	473	488	-7.1** (3.6)	-1.5%	(-13.1, -1.2)	0.05
Primary care substitutable outpatient ED visits[e]																		
Baseline	192	195	NA	NA	NA	NA	185	187	NA	NA	NA	NA	198	204	NA	NA	NA	NA

Table 5.A.6 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
PY 1	189	195	-2.2* (1.1)	-1.1%	(-4.1, -0.3)	0.06	183	187	-3.0** (1.5)	-1.6%	(-5.5, -0.6)	0.04	196	203	-1.2 (1.8)	-0.6%	(-4.1, 1.7)	0.49
PY 2	184	191	-3.8*** (1.3)	-2.0%	(-5.9, -1.7)	0.00	178	183	-4.4*** (1.7)	-2.4%	(-7.2, -1.6)	0.01	191	200	-3.1 (2.0)	-1.6%	(-6.3, 0.2)	0.12
PY 3	182	190	-4.6*** (1.4)	-2.5%	(-6.9, -2.3)	0.00	176	182	-4.3** (1.8)	-2.4%	(-7.2, -1.3)	0.02	187	198	-4.8** (2.2)	-2.5%	(-8.5, -1.2)	0.03
PY 4	134	142	-5.1*** (1.6)	-3.7%	(-7.7, -2.4)	0.00	128	136	-6.1*** (2.1)	-4.5%	(-9.6, -2.6)	0.00	139	148	-3.2 (2.5)	-2.2%	(-7.2, 0.9)	0.20
PY 1 through 4	171	179	-4.0*** (1.2)	-2.3%	(-6.0, -2.1)	0.00	165	171	-4.6*** (1.5)	-2.7%	(-7.1, -2.0)	0.00	177	186	-3.2* (1.8)	-1.8%	(-6.2, -0.2)	0.08
Potentially primary care preventable outpatient ED visits[e]																		
Baseline	131	133	NA	NA	NA	NA	125	127	NA	NA	NA	NA	138	140	NA	NA	NA	NA
PY 1	129	133	-2.1** (0.8)	-1.6%	(-3.4, -0.7)	0.01	123	127	-1.4 (1.1)	-1.1%	(-3.1, 0.3)	0.18	134	139	-2.7** (1.3)	-2.0%	(-4.8, -0.6)	0.03
PY 2	127	130	-1.5 (0.9)	-1.2%	(-3.0, 0.1)	0.11	121	124	-0.8 (1.2)	-0.7%	(-2.8, 1.2)	0.51	133	137	-2.1 (1.4)	-1.6%	(-4.5, 0.2)	0.13
PY 3	126	130	-1.8* (0.9)	-1.4%	(-3.3, -0.2)	0.06	121	124	-0.8 (1.2)	-0.6%	(-2.8, 1.2)	0.52	132	136	-2.8* (1.5)	-2.1%	(-5.2, -0.3)	0.06
PY 4	97	101	-2.2** (1.1)	-2.2%	(-4.0, -0.5)	0.04	91	96	-2.5* (1.4)	-2.6%	(-4.8, -0.2)	0.08	102	106	-1.9 (1.7)	-1.8%	(-4.6, 0.8)	0.25
PY 1 through 4	119	123	-1.9** (0.8)	-1.6%	(-3.2, -0.6)	0.02	114	117	-1.4 (1.0)	-1.2%	(-3.1, 0.3)	0.19	125	129	-2.4* (1.2)	-1.9%	(-4.5, -0.4)	0.05
Total Urgent Care Center (UCC) visits																		
Baseline	104	111	NA	NA	NA	NA	114	112	NA	NA	NA	NA	93	109	NA	NA	NA	NA
PY 1	119	126	0.4 (1.7)	0.3%	(-2.4, 3.1)	0.83	132	129	1.5 (2.3)	1.2%	(-2.2, 5.3)	0.50	105	123	-0.8 (2.5)	-0.8%	(-5.0, 3.3)	0.74
PY 2	135	139	2.6 (2.6)	2.0%	(-1.6, 6.9)	0.31	151	142	6.5** (2.9)	4.5%	(1.8, 11.3)	0.02	118	136	-1.4 (4.4)	-1.2%	(-8.7, 5.9)	0.75
PY 3	149	153	3.2 (3.8)	2.2%	(-3.0, 9.4)	0.40	167	162	3.7 (4.4)	2.2%	(-3.6, 10.9)	0.41	131	144	3.1 (6.2)	2.4%	(-7.2, 13.4)	0.62
PY 4	150	138	19.7*** (4.6)	15.0%	(12.0, 27.3)	0.00	172	150	19.9*** (5.0)	13.1%	(11.7, 28.1)	0.00	129	124	20.7*** (7.9)	19.2%	(7.7, 33.7)	0.01
PY 1 through 4	139	140	6.3** (2.7)	4.8%	(1.8, 10.9)	0.02	156	147	7.6** (3.0)	5.1%	(2.6, 12.6)	0.01	121	132	5.4 (4.7)	4.7%	(-2.3, 13.1)	0.25
Primary care substitutable UCC visits																		
Baseline	62	66	NA	NA	NA	NA	68	67	NA	NA	NA	NA	56	64	NA	NA	NA	NA
PY 1	72	75	0.0 (1.0)	0.0%	(-1.7, 1.7)	0.99	79	77	1.0 (1.4)	1.3%	(-1.3, 3.3)	0.49	64	73	-1.0 (1.5)	-1.5%	(-3.5, 1.5)	0.51
PY 2	82	83	1.6 (1.6)	2.0%	(-1.1, 4.2)	0.33	91	86	4.3** (1.9)	4.9%	(1.2, 7.3)	0.02	72	81	-1.2 (2.6)	-1.7%	(-5.6, 3.1)	0.64

Table 5.A.6 *(continued)*

	Track 1—Overall						Track 1—SSP						Track 1—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
PY 3	90	91	2.8 (2.3)	3.1%	(-1.0, 6.5)	0.22	101	96	4.2 (2.7)	4.4%	(-0.3, 8.8)	0.12	79	86	1.4 (3.6)	1.8%	(-4.6, 7.4)	0.70
PY 4	99	88	14.7*** (2.9)	17.4%	(9.9, 19.5)	0.00	115	97	16.8*** (3.4)	17.1%	(11.2, 22.4)	0.00	83	78	13.3*** (4.8)	19.0%	(5.4, 21.2)	0.01
PY 1 through 4	86	85	4.7*** (1.7)	5.7%	(1.9, 7.5)	0.01	97	90	6.3*** (2.0)	6.9%	(3.1, 9.5)	0.00	75	80	3.1 (2.8)	4.4%	(-1.4, 7.7)	0.26
Ambulatory primary care visits (including to FQHCs, RHCs, and CAHs)[f]																		
Baseline	4,255	4,370	NA	NA	NA	NA	4,207	4,340	NA	NA	NA	NA	4,305	4,403	NA	NA	NA	NA
PY 1	4,295	4,466	-55.3*** (15.1)	-1.3%	(-80.0, -30.5)	0.00	4,260	4,440	-46.5** (18.3)	-1.1%	(-76.6, -16.5)	0.01	4,332	4,495	-64.2*** (24.4)	-1.5%	(-104.3, -24.1)	0.01
PY 2	4,340	4,475	-18.8 (19.1)	-0.4%	(-50.2, 12.6)	0.33	4,297	4,434	-3.8 (24.5)	-0.1%	(-44.2, 36.6)	0.88	4,386	4,519	-35.0 (29.7)	-0.8%	(-83.9, 13.8)	0.24
PY 3	4,406	4,522	-0.5 (21.8)	0.0%	(-36.4, 35.4)	0.98	4,363	4,491	5.0 (28.2)	0.1%	(-41.3, 51.3)	0.86	4,451	4,555	-5.8 (33.7)	-0.1%	(-61.3, 49.7)	0.86
PY 4	3,964	4,092	-12.5 (26.5)	-0.3%	(-56.1, 31.0)	0.64	3,927	4,066	-5.5 (32.9)	-0.1%	(-59.6, 48.5)	0.87	4,001	4,117	-17.8 (42.4)	-0.4%	(-87.6, 51.9)	0.67
PY 1 through 4	4,246	4,384	-21.9 (18.6)	-0.5%	(-52.4, 8.7)	0.24	4,208	4,354	-13.1 (23.1)	-0.3%	(-51.1, 25.0)	0.57	4,286	4,415	-30.4 (29.5)	-0.7%	(-79.0, 18.2)	0.30
Ambulatory specialty care visits (including to FQHCs, RHCs, and CAHs)[f]																		
Baseline	4,526	4,407	NA	NA	NA	NA	4,836	4,611	NA	NA	NA	NA	4,201	4,183	NA	NA	NA	NA
PY 1	4,474	4,347	7.7 (9.8)	0.2%	(-8.5, 23.8)	0.43	4,765	4,550	-10.0 (13.0)	-0.2%	(-31.4, 11.4)	0.44	4,167	4,122	26.4* (14.8)	0.6%	(2.0, 50.7)	0.08
PY 2	4,496	4,353	23.5* (12.7)	0.5%	(2.5, 44.4)	0.07	4,818	4,572	20.5 (17.0)	0.4%	(-7.5, 48.5)	0.23	4,157	4,111	28.4 (18.8)	0.7%	(-2.6, 59.3)	0.13
PY 3	4,403	4,270	12.8 (14.7)	0.3%	(-11.3, 37.0)	0.38	4,735	4,504	5.9 (19.8)	0.1%	(-26.7, 38.6)	0.77	4,058	4,017	23.2 (21.2)	0.6%	(-11.8, 58.1)	0.28
PY 4	3,808	3,690	-1.3 (16.9)	0.0%	(-29.1, 26.5)	0.94	4,091	3,909	-43.4* (22.5)	-1.0%	(-80.4, -6.4)	0.05	3,520	3,451	51.5** (24.3)	1.5%	(11.6, 91.5)	0.03
PY 1 through 4	4,283	4,152	10.7 (12.0)	0.3%	(-9.1, 30.5)	0.37	4,592	4,373	-6.0 (16.1)	-0.1%	(-32.5, 20.5)	0.71	3,960	3,910	31.9* (17.5)	0.8%	(3.2, 60.7)	0.07
Unweighted sample sizes for measures per 1,000 beneficiaries per year[g]																		
Number of practices	1,373	5,243					738	2,979					635	2,264				
Number of beneficiaries	1,446,195	4,935,793					742,582	2,882,949					706,113	2,067,467				
Number of beneficiary-years	4,862,194	16,407,527					2,482,081	9,565,553					2,380,113	6,841,974				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

Table 5.A.6 *(continued)*

[a] We report the actual, unadjusted averages in the baseline period which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics and practice fixed effects.

[c] We calculated percentage impacts relative to what the CPC+ mean would have been in Program Years 1 through 4 (separately and combined) in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Total ED visits include ED/observation stays that led to a hospitalization, including a psychiatric hospitalization.

[e] The sum of primary care substitutable outpatient ED visits and potentially primary care preventable outpatient ED visits is less than total outpatient ED visits because total outpatient ED visits include those for other care needs, such as injuries, mental health, drugs, and alcohol.

[f] Ambulatory visits with primary care practitioners and specialists include office-based visits and visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

[g] After accounting for weights that adjust for matching and time observed in Medicare FFS, the effective sample sizes fall but are still substantial. For the comparison group, the effective sample size is 43 to 50 percent of the size of the actual comparison group. The effective sample size for the CPC+ group is 96 percent of the actual sample size because it is affected only by time observed (and not by the matching weights).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; CAH = critical access hospital; ED = emergency department; FFS = fee-for-service; FQHC = federally qualified health center; NA = not applicable; pp = percentage points; PY = Program Year

Table 5.A.7. Regression-adjusted means and estimated impact of CPC+ on telehealth outcomes (non-face-to-face ambulatory visits and associated expenditures) for attributed Medicare FFS beneficiaries in PY 4, Track 1

	Track 1 – Overall					Track 1 – SSP					Track 1 – Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	p-Value
Primary care visits															
Proportion of ambulatory primary care visits that are non-face-to- face[c,d]	15.7%	14.8%	0.9*** (0.3)	(0.4, 1.4)	0.01	16.2%	15.4%	0.8** (0.4)	(0.1, 1.5)	0.04	15.1%	13.7%	1.4*** (0.5)	(0.6, 2.2)	0.00
Proportion of expenditures on ambulatory primary care visits that are non-face-to-face[c,d]	14.3%	13.7%	0.6* (0.3)	(0.1, 1.2)	0.07	14.6%	14.3%	0.3 (0.4)	(-0.4, 1.0)	0.46	14.0%	12.6%	1.4*** (0.5)	(0.5, 2.2)	0.01
Specialist care visits															
Proportion of ambulatory specialist visits that are non-face-to-face[c,d]	11.4%	11.1%	0.3** (0.2)	(0.1, 0.6)	0.04	11.8%	11.7%	0.1 (0.2)	(-0.2, 0.4)	0.68	11.0%	10.2%	0.9*** (0.2)	(0.5, 1.3)	0.00
Proportion of expenditures on ambulatory specialist visits that are non-face-to-face[c,d]	11.3%	11.0%	0.4** (0.2)	(0.1, 0.7)	0.03	11.6%	11.5%	0.1 (0.2)	(-0.2, 0.4)	0.61	11.0%	10.1%	0.9*** (0.3)	(0.5, 1.4)	0.00
Unweighted sample sizes for non-face-to-face primary care visits proportion measure															
Number of practices	1,373	5,242				738	2,979				635	2,263			
Number of beneficiaries	921,865	3,208,878				463,451	1,877,137				458,414	1,331,741			
Unweighted sample sizes for non-face-to-face primary care expenditures proportion measure															
Number of practices	1,373	5,242				738	2,979				635	2,263			
Number of beneficiaries	873,361	3,027,459				439,442	1,775,341				433,919	1,252,118			
Unweighted sample sizes for non-face-to-face specialist care visits proportion measure															
Number of practices	1,373	5,242				738	2,979				635	2,263			
Number of beneficiaries	778,690	2,695,402				400,177	1,596,824				378,513	1,098,578			
Unweighted sample sizes for non-face-to-face specialist care expenditures proportion measure															
Number of practices	1,373	5,242				738	2,979				635	2,263			
Number of beneficiaries	730,805	2,526,510				376,686	1,499,610				354,119	1,026,900			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] The comparison group mean is computed by subtracting the regression adjusted difference between the CPC+ and comparison means in PY 4 from the CPC+ mean in PY 4.

Table 5.A.7 *(continued)*

[b] Because non-face-to-face visits were close to zero in the baseline period (and the first three intervention years) for both CPC+ and comparison practices, we use a straight differences model for the non-face-to-face visit and expenditure outcomes. The estimate reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in PY 4 to the average outcome for Medicare FFS beneficiaries attributed to comparison practices in the same time period while controlling for beneficiary characteristics and (selected) outcomes at baseline.

[c] Ambulatory visits are identified as face-to-face or non-face-to-face based on procedure codes, telehealth modifiers, and place of service (carrier file only) on Medicare claims. Visits such as telephone and online assessment and management and E&M are included in the non-face-to-face measure, making it broader than CMS's definition of "telehealth" visits.

[d] Measures include only beneficiaries with non-zero counts of visits or expenditures. Sample sizes for each measure shown in table.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C. Claims-based quality of care

C.1. Planned care and population health measures

There were modest improvements (generally 1 percentage point or less) among CPC+ Track 1 practices relative to comparison practices in quality of care for diabetes over the first four program years. Specifically, over the first four program years, among patients with diabetes attributed to Track 1 practices relative to those in comparison practices (Table 5.A.8), the likelihood of:

- Receiving HbA1c testing increased by 0.3 percentage points ($p = 0.08$).
- Receiving an eye exam increased by 0.9 percentage points ($p < 0.01$).
- Receiving attention for nephropathy increased by 0.8 percentage points ($p < 0.01$).
- Receiving all three recommended tests (HbA1c testing, eye exam, and attention for nephropathy) increased by 1.1 percentage points ($p < 0.01$).
- Receiving none of the three tests declined by 0.2 percentage points ($p < 0.01$).

Notably, before CPC+ began, more than 90 percent of beneficiaries at Track 1 CPC+ and comparison practices with diabetes were receiving HbA1c testing. It may, therefore, be difficult for practices to improve substantially on this measure. In contrast, in the year before CPC+, only 64 percent of beneficiaries received eye exams, 81 percent received attention for nephropathy, and 52 percent received all three tests, leaving more room for improvement in each measure.

Estimates were generally similar in magnitude across the program years. However, these estimates translate to only small increases in the additional number of beneficiaries receiving these services at CPC+ Track 1 practices relative to comparison practices because of the small number of patients with diabetes at any practice. For example, these estimates imply that, per practice, an additional 0.9 patients with diabetes received an eye exam and 1.1 beneficiaries with diabetes received all three tests.

Improvements in two of the five measures for patients with diabetes occurred mainly among the non-SSP practices, though the sizes of the estimates were still smaller than 2 percentage points in that subgroup. Specifically, the increases in the likelihood of receiving an eye exam and the composite measure of receiving all three recommended tests were 1.5 percentage points and 1.6 percentage points, respectively, among Track 1 non-SSP practices ($p < 0.01$ for both tests), and significantly different from the even smaller changes for both measures among Track 1 SSP practices ($p = 0.02$ and $p = 0.10$, respectively, for the difference by SSP subgroup). Effects on the other diabetes measures were similar across SSP and non-SSP practices.

Among Track 1 practices, CPC+ was also associated with a less than 1 percentage point increase in breast cancer screening. About 73 percent of female beneficiaries ages 52 through 74 attributed to Track 1 or comparison practices received breast cancer screening at baseline. Over the first four program years, there was a 0.7 percentage point larger increase ($p < 0.01$) in breast cancer screening for Track 1 practices relative to their comparison practices, translating to additional 1.2 female beneficiaries (aged 52 through 74) receiving breast cancer screening per

practice per year at CPC+ practices. The overall impact was driven by non-SSP practices, where the estimate was 1.4 percentage points ($p < 0.01$) and significantly different ($p < 0.01$ for the difference by SSP subgroup) from the estimate among SSP practices, which was close to zero.

There was little evidence that CPC+ Track 1 improved appropriate medication use[27] over the first four program years. In fact, the few statistically significant effects that we did observe in the measures of appropriate use of medications were unfavorable (Table 5.A.8). For example, in the percentage of beneficiaries who were adherent to renin-angiotensin system antagonists, where there was a small annual average decrease in adherence of 0.3 percentage points ($p = 0.02$) among Track 1 CPC+ practices relative to comparison practices between baseline and the intervention period. The estimates for other medication measures (such as the percentage of beneficiaries who were adherent to diabetes medications or statins) were not statistically significant.

C.2. Measures for continuity of care

The estimates for our measures of continuity of care were less than a percentage point—and in most cases were not meaningful or statistically significant. We examined three claims-based continuity-of-care measures: (1) the percentage of primary care ambulatory visits at the beneficiary's assigned practice, (2) the percentage of visits with the usual provider of care, and (3) the reversed Bice-Boxerman Index (rBBI).[28] For the last two measures, we created two versions: one that treated each practitioner associated with the beneficiary's assigned practice separately, and another that treated all practitioners in the assigned practice as a single practitioner. We did so because fragmentation calculated at the practitioner level could overstate true fragmentation when there is team-based care. The overall impact estimates for all five measures of continuity of care were small in magnitude—less than 1 percentage point or less than 1 on an index scale ranging from 0 to 100—and were mostly not statistically significant.

For the two measures of the percentage of visits with the usual provider of care, the average annual estimate indicated a relative decrease of 0.2 percentage points ($p = 0.03$ when each practitioner in the beneficiary's assigned practice is treated separately, and $p = 0.04$ when they are treated as a single practitioner), and the estimated decrease was more pronounced in PY 4 (Table 5.A.8). Importantly, the annual means for the percentage of visits with the usual provider of care increased in PY 4 compared to previous years for both CPC+ Track 1 and comparison groups, which could result from fewer ambulatory visits overall (or smaller denominators for the measure) during the pandemic. This COVID-19-induced disruption possibly resulted in greater

[27] The five measures of appropriate use of medications in the planned care and population health domain were defined as: (1) percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy, (2) percentage of beneficiaries on diabetes medications with >80 percent of days covered by medication, (3) percentage of beneficiaries on renin-angiotensin system antagonists with >80 percent of days covered by medication, (4) percentage of beneficiaries on statins with >80 percent of days covered by medication, and (5) percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.

[28] As described in Appendix 5.B, the rBBI identifies the number of practitioners providing ambulatory services to a beneficiary and the percentage of care each practitioner provides. rBBI values range from 0 (all visits made to the same practitioner) to 100 (each visit made to a different practitioner). Higher rBBI scores indicate more fragmented care.

measured continuity of care for both Track 1 and comparison practices in PY 4, but with a smaller magnitude for Track 1 practices. This could happen if CPC+ Track 1 practices were more successful in directing patients into alternative care settings including telehealth visits during the pandemic.

C.3. Other quality-of-care measures

Estimated effects of CPC+ Track 1 on unplanned readmissions and unplanned acute care following hospital or ED discharges were neither sizable nor statistically significant. Specifically, for Track 1 practices, the rate of unplanned readmissions within 30 days of a hospital discharge did not differ relative to comparison practices (0.2 percentage points, $p = 0.12$) (Table 5.A.8). Similarly, the estimates on the percentages of index acute hospital discharges or ED discharges followed by unplanned acute care (hospitalization or ED visit including observation stays) within 30 days were close to zero. There were also no effects on these outcomes measured at the beneficiary level (instead of the discharge level).

Track 1 practices had 0.1 percentage point relative increases in the proportion of beneficiaries using hospice services and 3 more days in their average days of hospice use among hospice users. CPC+ practices are expected to engage patients and caregivers in planning and making decisions on health care use and end-of-life planning. Over the first four program years, there was an increase of 0.1 percentage point ($p < 0.01$) in the proportion of beneficiaries with any use of hospice services during the year for Track 1 practices relative to the comparison practices (Table 5.A.8). Because only about 3 percent of beneficiaries in both Track 1 and comparison practices used hospice services at baseline, a 0.1 percentage point increase is small, but meaningful, signifying a 2.9 percent increase (or an average of 0.7 additional beneficiaries receiving hospice services per practice per year). The average number of days in hospice (among hospice users) increased by 3 days (4.5 percent) for CPC+ Track 1 practices relative to comparison practices during the first four program years ($p < 0.01$) (Table 5.A.8). There was also an increase in the length of hospice stay when calculated among the full sample of beneficiaries (regardless of whether they were hospice users or not) of 0.2 days (8.1 percent, $p < 0.01$). The results were similar between SSP and non-SSP groups.

CPC+ Track 1 had an impact on only one of three additional medication-related quality-of-care measures we examined, as potential opioid overuse fell more between the baseline and follow-up periods for Track 1 relative to comparison practices. We analyzed the impact of CPC+ on three medication-related quality-of-care measures: (1) use of high-risk medications in the elderly (defined as the percentage of beneficiaries age 65 and older who received two or more medications with a high risk designation within the same class); (2) any long-term use of opioids (defined as having 90 or more days' supply of opioids in a year with no more than a 7-day gap between prescriptions); and (3) potential overuse of opioids (defined as the use of opioids at a daily dosage of 90 morphine milligram equivalents [MMEs] or more among long-term users). Of these measures, we found a 0.9 percentage point reduction in potential opioid overuse in PY 3 ($p < 0.01$) and a 0.8 percentage point reduction in PY 4 ($p = 0.02$) among Track 1 practices; this translated to an average annual decrease of 0.4 percentage points ($p = 0.08$) over the first four program years. Although CPC+ does not have the explicit goal of reducing high-dose opioid prescribing, the participating practices were required to implement several approaches that could have improved prescribing behaviors (such as comprehensive

medication management [CMM], screening for behavioral health conditions, and either co-locating a credentialed behavioral health staff member in the practice or designating a practitioner or team member to provide care management for behavioral health conditions). However, the estimates for other medication-related measures—long-term opioid use and high-risk medication use (such as antispasmodics, antithrombotics, and non-benzodiazepine hypnotics; see Appendix 5.B for more details on this measure definition)—were close to zero and were not statistically significant. For both measures, the estimated impacts differ between SSP and non-SSP practices—that is, the estimates were favorable (for the long-term opioid use) or not statistically significant (for the high-risk medication use) in the Track 1 SSP group, while the corresponding estimates in the Track 1 non-SSP group were mostly unfavorable (with average annual increases of 0.3 percentage points [$p < 0.01$] and of 0.2 percentage points [$p = 0.09$], respectively). These differential effects by SSP status led to the null findings in the overall sample for both outcomes when all four years were combined.[29]

C.4. Mortality

CPC+ did not affect mortality. There were no meaningful or statistically significant differences between beneficiaries attributed in the first quarter of the intervention to Track 2 CPC+ versus comparison practices with respect to the percentage of beneficiaries dying during the next 12 months (4 percent), 24 months (8 percent), 36 months (12 percent), or 48 months (17 percent) of the model (results not shown).

[29] For the long-term use of opioids, the results for Track 1 non-SSP practices should be interpreted with caution, because we found that CPC+ and comparison practices experienced different trends in long-term opioid use in the Track 1 non-SSP group even before CPC+ began (see Appendix 5.H for more details).

Table 5.A.8. Regression-adjusted means and estimated impact of CPC+ on selected claims-based quality-of-care measures for attributed Medicare FFS beneficiaries over the first four program years, Track 1

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Planned care and population health measures for beneficiaries ages 18–75 with diabetes (percentage)															
Received HbA1c test															
Baseline	90.8%	91.6%	NA	NA	NA	91.9%	92.1%	NA	NA	NA	89.8%	91.0%	NA	NA	NA
PY 1	91.1%	91.9%	0.0 (0.2)	(-0.2, 0.3)	0.76	92.1%	92.3%	0.1 (0.2)	(-0.2, 0.4)	0.69	90.1%	91.4%	0.0 (0.2)	(-0.4, 0.4)	0.94
PY 2	91.2%	91.8%	0.1 (0.2)	(-0.2, 0.4)	0.53	92.3%	92.1%	0.4* (0.2)	(0.0, 0.8)	0.06	90.0%	91.5%	-0.2 (0.3)	(-0.7, 0.2)	0.45
PY 3	91.3%	91.7%	0.4* (0.2)	(0.0, 0.8)	0.09	92.4%	91.9%	0.8** (0.4)	(0.2, 1.4)	0.04	90.3%	91.5%	0.0 (0.3)	(-0.5, 0.5)	0.93
PY 4	88.3%	88.5%	0.6** (0.3)	(0.2, 1.0)	0.02	89.4%	88.9%	0.7** (0.4)	(0.1, 1.3)	0.05	87.3%	88.1%	0.5 (0.3)	(-0.1, 1.0)	0.15
PY 1 through 4	90.5%	90.9%	0.3* (0.2)	(0.0, 0.6)	0.08	91.6%	91.3%	0.5** (0.2)	(0.1, 0.9)	0.03	89.4%	90.6%	0.1 (0.2)	(-0.3, 0.5)	0.76
Received eye exam															
Baseline	63.5%	64.4%	NA	NA	NA	64.6%	66.2%	NA	NA	NA	62.4%	62.6%	NA	NA	NA
PY 1	64.8%	65.0%	0.7*** (0.2)	(0.3, 1.1)	0.00	65.0%	66.8%	-0.3 (0.3)	(-0.8, 0.3)	0.42	64.6%	63.1%	1.7*** (0.3)	(1.2, 2.2)	0.00
PY 2	65.7%	65.3%	1.3*** (0.3)	(0.9, 1.7)	0.00	66.2%	67.1%	0.6 (0.4)	(0.0, 1.2)	0.11	65.2%	63.4%	2.0*** (0.4)	(1.4, 2.6)	0.00
PY 3	65.6%	65.9%	0.6** (0.3)	(0.1, 1.1)	0.04	66.2%	67.2%	0.5 (0.4)	(-0.2, 1.1)	0.23	65.1%	64.5%	0.8* (0.5)	(0.0, 1.6)	0.09
PY 4	61.3%	61.1%	1.1*** (0.3)	(0.6, 1.7)	0.00	61.3%	62.0%	0.8* (0.4)	(0.1, 1.5)	0.07	61.3%	60.1%	1.5*** (0.5)	(0.7, 2.3)	0.00
PY 1 through 4	64.3%	64.3%	0.9*** (0.2)	(0.5, 1.3)	0.00	64.7%	65.8%	0.4 (0.3)	(-0.1, 0.9)	0.23	64.0%	62.7%	1.5*** (0.3)	(0.9, 2.1)	0.00
Received attention for nephropathy															
Baseline	80.9%	80.9%	NA	NA	NA	82.4%	81.7%	NA	NA	NA	79.3%	80.0%	NA	NA	NA
PY 1	81.9%	81.2%	0.6*** (0.2)	(0.2, 1.0)	0.01	83.2%	82.0%	0.4 (0.3)	(-0.1, 0.9)	0.17	80.5%	80.4%	0.9** (0.4)	(0.3, 1.5)	0.02
PY 2	82.4%	81.3%	1.0*** (0.3)	(0.6, 1.5)	0.00	83.7%	82.2%	0.8** (0.4)	(0.2, 1.4)	0.02	81.0%	80.4%	1.3*** (0.5)	(0.5, 2.0)	0.01
PY 3	82.4%	81.7%	0.7** (0.3)	(0.2, 1.3)	0.03	83.7%	82.8%	0.2 (0.4)	(-0.4, 0.9)	0.56	81.1%	80.5%	1.2** (0.5)	(0.4, 2.1)	0.02
PY 4	78.9%	78.2%	0.7* (0.4)	(0.1, 1.3)	0.06	80.0%	79.2%	0.2 (0.5)	(-0.6, 0.9)	0.72	77.8%	77.2%	1.3** (0.6)	(0.4, 2.3)	0.02
PY 1 through 4	81.4%	80.6%	0.8*** (0.3)	(0.3, 1.2)	0.00	82.6%	81.5%	0.4 (0.3)	(-0.1, 1.0)	0.21	80.1%	79.6%	1.2*** (0.4)	(0.5, 1.9)	0.00

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Diabetes Composite Measure 1 (received all three tests above: HbA1c test, eye exam, attention for nephropathy)															
Baseline	51.0%	51.9%	NA	NA	NA	53.2%	53.9%	NA	NA	NA	48.8%	49.8%	NA	NA	NA
PY 1	52.4%	52.8%	0.5** (0.3)	(0.1, 1.0)	0.04	53.7%	54.8%	-0.4 (0.4)	(-1.0, 0.2)	0.30	51.1%	50.6%	1.5*** (0.4)	(0.9, 2.1)	0.00
PY 2	53.7%	53.0%	1.6*** (0.3)	(1.1, 2.1)	0.00	55.4%	55.0%	1.1** (0.4)	(0.4, 1.8)	0.01	52.0%	50.9%	2.1*** (0.5)	(1.4, 2.9)	0.00
PY 3	53.6%	53.6%	0.9** (0.4)	(0.3, 1.5)	0.02	55.4%	55.2%	0.9* (0.5)	(0.1, 1.7)	0.08	51.8%	51.9%	0.9* (0.6)	(0.0, 1.9)	0.09
PY 4	47.9%	47.3%	1.5*** (0.4)	(0.8, 2.1)	0.00	48.9%	48.6%	1.1** (0.5)	(0.2, 1.9)	0.04	46.9%	46.0%	1.9*** (0.6)	(0.9, 2.9)	0.00
PY 1 through 4	51.9%	51.7%	1.1*** (0.3)	(0.7, 1.6)	0.00	53.3%	53.4%	0.7* (0.4)	(0.0, 1.3)	0.08	50.4%	49.8%	1.6*** (0.4)	(0.9, 2.3)	0.00
Diabetes Composite Measure 2 (received none of the three tests above)															
Baseline	2.5%	2.3%	NA	NA	NA	2.3%	2.1%	NA	NA	NA	2.7%	2.5%	NA	NA	NA
PY 1	2.3%	2.3%	-0.2** (0.1)	(-0.3, -0.1)	0.01	2.1%	2.1%	-0.2** (0.1)	(-0.4, -0.1)	0.03	2.5%	2.4%	-0.2 (0.1)	(-0.4, 0.0)	0.16
PY 2	2.3%	2.3%	-0.2** (0.1)	(-0.3, -0.1)	0.02	2.2%	2.1%	-0.1 (0.1)	(-0.3, 0.1)	0.30	2.4%	2.4%	-0.3** (0.1)	(-0.5, -0.1)	0.02
PY 3	2.3%	2.2%	-0.2* (0.1)	(-0.3, 0.0)	0.06	2.1%	2.1%	-0.1 (0.1)	(-0.3, 0.1)	0.50	2.4%	2.4%	-0.3* (0.1)	(-0.5, 0.0)	0.05
PY 4	3.5%	3.6%	-0.2** (0.1)	(-0.4, 0.0)	0.04	3.4%	3.4%	-0.1 (0.1)	(-0.3, 0.1)	0.42	3.7%	3.7%	-0.3** (0.2)	(-0.6, -0.1)	0.04
PY 1 through 4	2.6%	2.6%	-0.2*** (0.1)	(-0.3, -0.1)	0.01	2.4%	2.4%	-0.1 (0.1)	(-0.3, 0.0)	0.17	2.7%	2.8%	-0.3** (0.1)	(-0.5, -0.1)	0.02
Unweighted sample sizes for the diabetes measures[c]															
Number of beneficiaries	243,297	830,919				123,462	476,251				120,140	356,397			
Number of beneficiary-years	658,490	2,228,058				332,637	1,276,018				325,853	952,040			

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Planned care and population health measures for female beneficiaries ages 52–74 (percentage)															
Received breast cancer screening															
Baseline	72.6%	73.2%	NA	NA	NA	73.6%	74.0%	NA	NA	NA	71.5%	72.3%	NA	NA	NA
PY 1	73.5%	73.7%	0.4*** (0.2)	(0.2, 0.7)	0.01	74.3%	74.6%	0.1 (0.2)	(-0.2, 0.4)	0.67	72.7%	72.7%	0.8*** (0.2)	(0.4, 1.1)	0.00
PY 2	74.3%	74.0%	0.9*** (0.2)	(0.6, 1.3)	0.00	74.9%	75.1%	0.2 (0.3)	(-0.3, 0.6)	0.49	73.7%	72.8%	1.7*** (0.3)	(1.2, 2.2)	0.00
PY 3	74.9%	74.7%	0.8*** (0.2)	(0.4, 1.2)	0.00	75.4%	75.8%	0.1 (0.3)	(-0.5, 0.6)	0.86	74.4%	73.6%	1.6*** (0.3)	(1.1, 2.1)	0.00
PY 4	73.0%	72.9%	0.7*** (0.2)	(0.3, 1.1)	0.00	73.1%	73.6%	-0.1 (0.3)	(-0.7, 0.4)	0.70	72.8%	72.1%	1.5*** (0.4)	(0.9, 2.1)	0.00
PY 1 through 4	73.9%	73.8%	0.7*** (0.2)	(0.4, 1.0)	0.00	74.4%	74.8%	0.0 (0.2)	(-0.4, 0.5)	0.85	73.4%	72.8%	1.4*** (0.3)	(1.0, 1.9)	0.00
Unweighted sample sizes for the breast cancer screening measure[c]															
Number of beneficiaries	399,365	1,331,511				204,063	774,487				195,858	560,202			
Number of beneficiary-years	1,115,160	3,701,562				566,741	2,146,134				548,419	1,555,428			
Planned care and population health measures for beneficiaries ages 21 and older[d]															
Percentage of beneficiaries with cardiovascular disease who were prescribed and filled statin therapy															
Baseline	58.9%	59.1%	NA	NA	NA	58.6%	59.6%	NA	NA	NA	59.2%	58.5%	NA	NA	NA
PY 1	60.2%	60.4%	0.0 (0.1)	(-0.2, 0.1)	0.73	60.0%	61.1%	-0.2 (0.1)	(-0.4, 0.1)	0.24	60.5%	59.7%	0.1 (0.1)	(-0.1, 0.4)	0.44
PY 2	59.4%	59.8%	-0.2 (0.1)	(-0.4, 0.0)	0.16	58.9%	60.2%	-0.4** (0.2)	(-0.6, -0.1)	0.04	60.0%	59.2%	0.0 (0.2)	(-0.3, 0.3)	0.96
PY 3	60.7%	61.0%	-0.2 (0.2)	(-0.4, 0.1)	0.25	60.3%	61.5%	-0.2 (0.2)	(-0.6, 0.1)	0.23	61.1%	60.4%	-0.1 (0.2)	(-0.5, 0.3)	0.68
PY 4	61.4%	61.9%	-0.3* (0.2)	(-0.6, 0.0)	0.08	61.1%	62.3%	-0.3 (0.2)	(-0.6, 0.1)	0.23	61.7%	61.3%	-0.3 (0.3)	(-0.7, 0.2)	0.32
PY 1 through 4	60.5%	60.8%	-0.2 (0.1)	(-0.4, 0.0)	0.15	60.1%	61.3%	-0.3 (0.2)	(-0.5, 0.0)	0.10	60.8%	60.2%	-0.1 (0.2)	(-0.4, 0.3)	0.74

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Unweighted sample sizes for the statin therapy measure[c]															
Number of beneficiaries	767,430	2,540,262				408,544	1,497,449				359,927	1,048,431			
Number of beneficiary-years	2,295,674	7,538,405				1,219,842	4,442,370				1,075,832	3,096,035			
Planned care and population health measures for beneficiaries ages 18 and older[d]															
Percentage of beneficiaries on diabetes medications with proportion of days covered by medication > 80%															
Baseline	79.5%	79.6%	NA	NA	NA	80.0%	80.2%	NA	NA	NA	78.9%	78.9%	NA	NA	NA
PY 1	80.4%	80.7%	-0.2 (0.2)	(-0.6, 0.2)	0.33	80.9%	81.0%	0.1 (0.3)	(-0.4, 0.6)	0.74	79.8%	80.4%	-0.6* (0.3)	(-1.2, 0.0)	0.09
PY 2	81.5%	81.7%	-0.2 (0.2)	(-0.6, 0.2)	0.49	81.9%	81.9%	0.2 (0.3)	(-0.3, 0.7)	0.59	81.0%	81.5%	-0.5 (0.4)	(-1.1, 0.1)	0.15
PY 3	82.5%	82.6%	-0.1 (0.2)	(-0.5, 0.3)	0.76	82.8%	83.0%	0.0 (0.3)	(-0.5, 0.5)	0.91	82.1%	82.3%	-0.2 (0.4)	(-0.8, 0.4)	0.61
PY 4	84.5%	84.4%	0.2 (0.2)	(-0.2, 0.6)	0.43	84.7%	84.6%	0.3 (0.3)	(-0.3, 0.8)	0.44	84.3%	84.2%	0.0 (0.4)	(-0.6, 0.7)	0.90
PY 1 through 4	82.3%	82.5%	-0.1 (0.2)	(-0.4, 0.3)	0.73	82.7%	82.7%	0.1 (0.3)	(-0.3, 0.6)	0.58	81.9%	82.2%	-0.3 (0.3)	(-0.8, 0.2)	0.31
Percentage of beneficiaries on renin-angiotensin system antagonists with proportion of days covered by medication > 80%															
Baseline	81.0%	80.7%	NA	NA	NA	81.3%	81.2%	NA	NA	NA	80.6%	80.3%	NA	NA	NA
PY 1	83.5%	83.5%	-0.2* (0.1)	(-0.5, 0.0)	0.08	83.8%	84.0%	-0.3* (0.2)	(-0.6, 0.0)	0.06	83.1%	82.9%	-0.1 (0.2)	(-0.4, 0.2)	0.57
PY 2	84.4%	84.2%	0.0 (0.1)	(-0.2, 0.2)	0.98	84.7%	84.6%	-0.1 (0.2)	(-0.4, 0.2)	0.73	84.1%	83.7%	0.1 (0.2)	(-0.3, 0.4)	0.77
PY 3	84.0%	84.3%	-0.5*** (0.1)	(-0.7, -0.3)	0.00	84.2%	84.6%	-0.5*** (0.2)	(-0.9, -0.2)	0.00	83.8%	83.9%	-0.5** (0.2)	(-0.8, -0.1)	0.02
PY 4	86.2%	86.3%	-0.3** (0.1)	(-0.5, -0.1)	0.02	86.5%	86.6%	-0.2 (0.2)	(-0.6, 0.1)	0.21	85.9%	85.9%	-0.4** (0.2)	(-0.7, -0.1)	0.05
PY 1 through 4	84.6%	84.6%	-0.3** (0.1)	(-0.5, -0.1)	0.02	84.8%	85.0%	-0.3* (0.2)	(-0.6, 0.0)	0.06	84.3%	84.2%	-0.2 (0.2)	(-0.5, 0.0)	0.16

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Percentage of beneficiaries on statins with proportion of days covered by medication > 80%															
Baseline	78.5%	78.7%	NA	NA	NA	78.7%	79.2%	NA	NA	NA	78.3%	78.2%	NA	NA	NA
PY 1	78.4%	78.6%	-0.1 (0.1)	(-0.3, 0.2)	0.68	78.6%	79.3%	-0.2 (0.2)	(-0.5, 0.1)	0.26	78.1%	77.9%	0.1 (0.2)	(-0.2, 0.5)	0.57
PY 2	81.9%	82.0%	0.1 (0.1)	(-0.1, 0.3)	0.45	81.9%	82.3%	0.1 (0.2)	(-0.2, 0.3)	0.72	81.8%	81.6%	0.1 (0.2)	(-0.2, 0.5)	0.52
PY 3	82.5%	82.9%	-0.2 (0.1)	(-0.4, 0.0)	0.19	82.5%	83.3%	-0.3 (0.2)	(-0.6, 0.0)	0.13	82.6%	82.6%	-0.1 (0.2)	(-0.5, 0.3)	0.64
PY 4	85.1%	85.3%	0.0 (0.1)	(-0.3, 0.2)	0.80	85.1%	85.5%	0.1 (0.2)	(-0.2, 0.4)	0.58	85.0%	85.1%	-0.2 (0.2)	(-0.5, 0.2)	0.48
PY 1 through 4	82.1%	82.4%	0.0 (0.1)	(-0.2, 0.2)	0.73	82.2%	82.7%	-0.1 (0.1)	(-0.3, 0.2)	0.64	82.1%	82.0%	0.0 (0.2)	(-0.3, 0.3)	0.97
Percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed and filled angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy															
Baseline	76.8%	75.9%	NA	NA	NA	76.4%	75.7%	NA	NA	NA	77.2%	76.1%	NA	NA	NA
PY 1	76.6%	75.9%	-0.2 (0.3)	(-0.7, 0.2)	0.40	76.5%	75.7%	0.1 (0.3)	(-0.4, 0.7)	0.69	76.7%	76.2%	-0.7 (0.4)	(-1.4, 0.0)	0.11
PY 2	76.1%	75.4%	-0.2 (0.3)	(-0.7, 0.3)	0.50	75.8%	74.8%	0.2 (0.4)	(-0.4, 0.8)	0.56	76.4%	76.0%	-0.7 (0.5)	(-1.5, 0.1)	0.15
PY 3	75.9%	75.4%	-0.4 (0.3)	(-0.9, 0.1)	0.21	75.5%	74.9%	-0.1 (0.4)	(-0.7, 0.5)	0.77	76.4%	76.0%	-0.7 (0.5)	(-1.6, 0.1)	0.14
PY 4	74.4%	74.1%	-0.6* (0.3)	(-1.2, 0.0)	0.07	74.2%	73.7%	-0.3 (0.4)	(-1.0, 0.4)	0.53	74.7%	74.4%	-0.9 (0.5)	(-1.7, 0.0)	0.10
PY 1 through 4	75.7%	75.2%	-0.4 (0.3)	(-0.8, 0.1)	0.15	75.5%	74.8%	0.0 (0.3)	(-0.5, 0.5)	0.94	76.0%	75.6%	-0.7* (0.4)	(-1.4, -0.1)	0.07
Unweighted sample sizes for percentage of beneficiaries on diabetes medications with proportion of days covered by medication> 80%															
Number of beneficiaries	170,119	569,135				88,417	331,048				81,877	239,163			
Number of beneficiary-years	464,150	1,545,487				240,741	898,906				223,409	646,581			
Unweighted sample sizes for percentage of beneficiaries on renin-angiotensin system antagonists with proportion of days covered by medication > 80%															
Number of beneficiaries	516,404	1,727,261				266,468	1,008,120				250,520	722,467			
Number of beneficiary-years	1,448,824	4,806,203				741,776	2,804,762				707,048	2,001,441			

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Unweighted sample sizes for percentage of beneficiaries on statins with proportion of days covered by medication > 80%															
Number of beneficiaries	591,195	1,986,374				309,499	1,174,485				282,402	815,975			
Number of beneficiary-years	1,732,595	5,796,573				903,052	3,430,638				829,543	2,365,935			
Unweighted sample sizes for percentage of beneficiaries with both CAD and diabetes who were prescribed and filled ACE inhibitor or ARB therapy															
Number of beneficiaries	143,440	446,566				77,847	259,361				65,716	187,768			
Number of beneficiary-years	297,314	921,528				160,752	536,985				136,562	384,543			
Measures for continuity of care[e]															
Percentage of primary care ambulatory visits at assigned practice															
Baseline	75.5%	73.7%	NA	NA	NA	75.7%	74.1%	NA	NA	NA	75.3%	73.2%	NA	NA	NA
PY 1	72.5%	70.6%	0.0 (0.2)	(-0.4, 0.5)	0.86	72.5%	71.1%	-0.2 (0.3)	(-0.7, 0.4)	0.58	72.4%	70.1%	0.3 (0.4)	(-0.3, 0.9)	0.42
PY 2	64.0%	61.7%	0.4 (0.5)	(-0.4, 1.2)	0.38	63.8%	62.2%	0.0 (0.7)	(-1.1, 1.1)	0.97	64.1%	61.2%	0.9 (0.6)	(-0.2, 1.9)	0.17
PY 3	61.4%	58.8%	0.8 (0.5)	(0.0, 1.6)	0.12	61.2%	59.0%	0.6 (0.7)	(-0.6, 1.8)	0.45	61.6%	58.5%	1.0 (0.7)	(-0.1, 2.2)	0.15
PY 4	54.6%	52.4%	0.4 (0.8)	(-0.8, 1.7)	0.57	53.7%	52.5%	-0.4 (1.0)	(-2.0, 1.3)	0.71	55.5%	52.1%	1.4 (1.1)	(-0.5, 3.3)	0.21
PY 1 through 4	62.7%	60.5%	0.4 (0.4)	(-0.3, 1.1)	0.30	62.5%	60.8%	0.0 (0.6)	(-1.0, 1.0)	0.99	63.0%	60.0%	0.9 (0.6)	(-0.1, 1.9)	0.12
Across all PCPs and specialists providing care to a patient, where each practitioner in the beneficiary's assigned practice is treated separately															
Percentage of visits with the usual provider of care (UPC)															
Baseline	48.4%	48.4%	NA	NA	NA	47.4%	47.8%	NA	NA	NA	49.3%	49.0%	NA	NA	NA
PY 1	47.4%	47.4%	-0.1 (0.1)	(-0.2, 0.0)	0.29	46.5%	46.8%	0.0 (0.1)	(-0.1, 0.2)	0.88	48.3%	48.1%	-0.2 (0.1)	(-0.4, 0.0)	0.12
PY 2	46.2%	46.3%	-0.2* (0.1)	(-0.3, 0.0)	0.07	45.3%	45.7%	-0.1 (0.1)	(-0.2, 0.1)	0.52	47.1%	47.0%	-0.2* (0.1)	(-0.5, 0.0)	0.07
PY 3	45.5%	45.6%	-0.1 (0.1)	(-0.2, 0.1)	0.32	44.7%	44.9%	0.1 (0.1)	(-0.1, 0.3)	0.44	46.3%	46.2%	-0.3** (0.1)	(-0.5, -0.1)	0.04
PY 4	47.9%	48.2%	-0.4*** (0.1)	(-0.5, -0.2)	0.00	47.2%	47.7%	-0.2* (0.1)	(-0.4, 0.0)	0.09	48.6%	48.8%	-0.5*** (0.2)	(-0.8, -0.3)	0.00
PY 1 through 4	46.7%	46.9%	-0.2** (0.1)	(-0.3, 0.0)	0.03	45.9%	46.3%	0.0 (0.1)	(-0.2, 0.1)	0.72	47.5%	47.5%	-0.3*** (0.1)	(-0.5, -0.1)	0.01
Reversed Bice-Boxerman fragmentation of care index															
Baseline	76.9	77.2	NA	NA	NA	77.6	77.7	NA	NA	NA	76.2	76.7	NA	NA	NA

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 1	77.9	78.2	0.0 (0.1)	(-0.1, 0.1)	0.80	78.5	78.7	-0.1 (0.1)	(-0.2, 0.1)	0.48	77.3	77.6	0.1 (0.1)	(-0.1, 0.3)	0.35
PY 2	79.1	79.3	0.1 (0.1)	(-0.1, 0.2)	0.40	79.6	79.8	0.0 (0.1)	(-0.2, 0.2)	0.88	78.5	78.8	0.1 (0.1)	(-0.1, 0.4)	0.32
PY 3	79.8	80.1	0.0 (0.1)	(-0.2, 0.1)	0.83	80.3	80.6	-0.1 (0.1)	(-0.3, 0.1)	0.24	79.3	79.6	0.1 (0.1)	(-0.1, 0.4)	0.45
PY 4	80.1	80.3	0.1 (0.1)	(-0.1, 0.2)	0.53	80.6	80.7	-0.1 (0.1)	(-0.3, 0.2)	0.70	79.6	79.8	0.2 (0.2)	(-0.1, 0.5)	0.24
PY 1 through 4	79.3	79.5	0.0 (0.1)	(-0.1, 0.2)	0.67	79.8	80.0	-0.1 (0.1)	(-0.2, 0.1)	0.51	78.7	79.0	0.1 (0.1)	(-0.1, 0.3)	0.26
Across all PCPs and specialists providing care to a patient, where all practitioners in the beneficiary's assigned practice are treated as a single practitioner															
Percentage of visits with the usual provider of care (UPC)															
Baseline	51.0%	51.0%	NA	NA	NA	49.9%	50.2%	NA	NA	NA	52.1%	51.9%	NA	NA	NA
PY 1	49.9%	50.0%	-0.1 (0.1)	(-0.2, 0.0)	0.14	48.8%	49.2%	-0.1 (0.1)	(-0.2, 0.1)	0.45	50.9%	50.9%	-0.1 (0.1)	(-0.3, 0.0)	0.19
PY 2	48.1%	48.4%	-0.2** (0.1)	(-0.4, -0.1)	0.03	47.1%	47.7%	-0.2** (0.1)	(-0.4, -0.1)	0.03	49.2%	49.1%	-0.2 (0.2)	(-0.4, 0.1)	0.28
PY 3	48.0%	48.2%	-0.1 (0.1)	(-0.3, 0.1)	0.40	47.0%	47.3%	0.0 (0.1)	(-0.3, 0.2)	0.77	49.1%	49.1%	-0.1 (0.2)	(-0.4, 0.1)	0.37
PY 4	49.9%	50.2%	-0.3** (0.1)	(-0.5, -0.1)	0.03	48.9%	49.6%	-0.4** (0.2)	(-0.6, -0.1)	0.01	50.8%	50.9%	-0.3 (0.2)	(-0.6, 0.1)	0.26
PY 1 through 4	49.0%	49.2%	-0.2** (0.1)	(-0.3, 0.0)	0.04	48.0%	48.4%	-0.2* (0.1)	(-0.3, 0.0)	0.09	50.0%	50.0%	-0.2 (0.1)	(-0.4, 0.0)	0.19
Reversed Bice-Boxerman fragmentation of care index															
Baseline	74.1	74.3	NA	NA	NA	75.0	75.1	NA	NA	NA	73.1	73.5	NA	NA	NA
PY 1	75.2	75.4	0.0 (0.1)	(-0.1, 0.2)	0.54	76.0	76.2	0.0 (0.1)	(-0.1, 0.2)	0.75	74.3	74.6	0.1 (0.1)	(-0.1, 0.3)	0.59
PY 2	77.0	77.1	0.2 (0.1)	(0.0, 0.3)	0.14	77.8	77.8	0.2* (0.1)	(0.0, 0.4)	0.08	76.2	76.4	0.1 (0.2)	(-0.2, 0.4)	0.60
PY 3	77.1	77.4	0.0 (0.1)	(-0.2, 0.2)	0.99	77.9	78.1	0.0 (0.2)	(-0.3, 0.2)	0.98	76.2	76.6	0.0 (0.2)	(-0.3, 0.3)	0.98
PY 4	77.9	78.1	0.1 (0.2)	(-0.2, 0.3)	0.72	78.7	78.7	0.1 (0.2)	(-0.2, 0.4)	0.45	77.1	77.5	0.0 (0.3)	(-0.5, 0.4)	0.96
PY 1 through 4	76.9	77.1	0.1 (0.1)	(-0.1, 0.2)	0.50	77.7	77.7	0.1 (0.1)	(-0.1, 0.3)	0.43	76.0	76.3	0.0 (0.2)	(-0.2, 0.3)	0.81
Unweighted sample sizes for percentage of primary care ambulatory visits at assigned practice[c]															
Number of beneficiaries	1,140,331	3,843,495				632,779	2,439,322				600,358	1,744,435			

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Number of beneficiary-years	3,320,259	11,073,570				1,950,609	7,505,092				1,875,403	5,354,551			
Unweighted sample sizes for percentage of visits with the usual provider of care[c]															
Number of beneficiaries	1,262,966	4,283,394				649,801	2,504,279				615,144	1,790,597			
Number of beneficiary-years	4,035,457	13,558,454				2,061,992	7,914,305				1,973,465	5,644,149			
Unweighted sample sizes for reversed Bice-Boxerman fragmentation of care index[c]															
Number of beneficiaries	1,140,331	3,843,495				589,114	2,253,495				552,857	1,599,463			
Number of beneficiary-years	3,320,259	11,073,570				1,712,075	6,500,045				1,608,184	4,573,525			
Other quality of care															
Percentage of index acute care hospital discharges that were followed by an unplanned readmission within 30 days															
Baseline	15.5%	15.8%	NA	NA	NA	15.4%	15.9%	NA	NA	NA	15.6%	15.7%	NA	NA	NA
PY 1	15.7%	15.8%	0.1 (0.1)	(-0.1, 0.4)	0.42	15.4%	15.7%	0.1 (0.2)	(-0.2, 0.4)	0.68	16.0%	15.9%	0.1 (0.2)	(-0.2, 0.5)	0.50
PY 2	15.8%	15.9%	0.2 (0.2)	(0.0, 0.5)	0.14	15.9%	16.0%	0.4* (0.2)	(0.0, 0.7)	0.06	15.8%	15.8%	0.1 (0.2)	(-0.3, 0.4)	0.83
PY 3	15.8%	16.0%	0.0 (0.2)	(-0.2, 0.3)	0.78	15.9%	16.1%	0.2 (0.2)	(-0.1, 0.6)	0.27	15.8%	16.0%	-0.2 (0.2)	(-0.5, 0.2)	0.47
PY 4	16.2%	16.0%	0.4*** (0.2)	(0.2, 0.7)	0.01	16.2%	16.0%	0.6** (0.2)	(0.2, 1.0)	0.01	16.3%	16.1%	0.3 (0.2)	(-0.1, 0.7)	0.21
PY 1 through 4	15.9%	15.9%	0.2 (0.1)	(0.0, 0.4)	0.12	15.8%	16.0%	0.3* (0.2)	(0.0, 0.6)	0.08	16.0%	15.9%	0.1 (0.2)	(-0.2, 0.4)	0.72
Percentage of index acute care hospital discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days															
Baseline	25.8%	26.0%	NA	NA	NA	25.3%	25.8%	NA	NA	NA	26.3%	26.3%	NA	NA	NA
PY 1	25.9%	26.1%	0.1 (0.2)	(-0.2, 0.3)	0.76	25.1%	25.8%	-0.2 (0.2)	(-0.6, 0.2)	0.34	26.7%	26.4%	0.4 (0.3)	(-0.1, 0.8)	0.17
PY 2	26.1%	26.2%	0.2 (0.2)	(-0.1, 0.5)	0.34	25.8%	26.0%	0.3 (0.2)	(-0.1, 0.7)	0.28	26.4%	26.4%	0.1 (0.3)	(-0.4, 0.5)	0.78
PY 3	26.1%	26.5%	-0.1 (0.2)	(-0.4, 0.2)	0.50	25.9%	26.3%	0.1 (0.2)	(-0.3, 0.5)	0.78	26.3%	26.7%	-0.3 (0.3)	(-0.8, 0.1)	0.23
PY 4	25.8%	25.7%	0.3 (0.2)	(0.0, 0.6)	0.11	25.4%	25.5%	0.3 (0.3)	(-0.1, 0.7)	0.27	26.2%	25.9%	0.3 (0.3)	(-0.1, 0.8)	0.24
PY 1 through 4	26.0%	26.1%	0.1 (0.1)	(-0.2, 0.3)	0.55	25.6%	25.9%	0.1 (0.2)	(-0.2, 0.4)	0.64	26.4%	26.4%	0.1 (0.2)	(-0.3, 0.5)	0.69
Percentage of index ED (including observation stays) discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days															
Baseline	29.5%	30.0%	NA	NA	NA	28.6%	29.2%	NA	NA	NA	30.3%	30.8%	NA	NA	NA

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 1	29.3%	29.9%	-0.1 (0.2)	(-0.4, 0.1)	0.41	28.5%	29.2%	-0.2 (0.2)	(-0.5, 0.2)	0.48	30.0%	30.6%	-0.1 (0.3)	(-0.5, 0.3)	0.66
PY 2	29.0%	29.7%	-0.2 (0.2)	(-0.5, 0.1)	0.29	28.1%	28.8%	-0.1 (0.2)	(-0.5, 0.3)	0.75	29.8%	30.7%	-0.3 (0.3)	(-0.7, 0.1)	0.25
PY 3	29.0%	29.7%	-0.2 (0.2)	(-0.5, 0.1)	0.35	28.2%	28.9%	-0.1 (0.2)	(-0.6, 0.3)	0.54	29.8%	30.5%	-0.2 (0.3)	(-0.6, 0.2)	0.47
PY 4	29.1%	29.7%	-0.1 (0.2)	(-0.4, 0.3)	0.75	28.5%	28.9%	0.2 (0.3)	(-0.3, 0.6)	0.50	29.6%	30.4%	-0.3 (0.3)	(-0.8, 0.3)	0.42
PY 1 through 4	29.1%	29.8%	-0.1 (0.2)	(-0.4, 0.1)	0.33	28.3%	28.9%	-0.1 (0.2)	(-0.4, 0.3)	0.75	29.8%	30.6%	-0.2 (0.2)	(-0.6, 0.2)	0.34
Percentage of 65 and older Medicare FFS beneficiaries who received two or more prescriptions for high risk medications in the same class[d]															
Baseline	11.9%	12.1%	NA	NA	NA	11.6%	11.6%	NA	NA	NA	12.1%	12.5%	NA	NA	NA
PY 1	12.1%	12.3%	0.0 (0.1)	(-0.1, 0.1)	0.85	11.8%	11.9%	-0.1 (0.1)	(-0.2, 0.0)	0.28	12.5%	12.8%	0.1 (0.1)	(-0.1, 0.2)	0.42
PY 2	11.9%	12.2%	-0.1* (0.1)	(-0.2, 0.0)	0.06	11.5%	11.8%	-0.2** (0.1)	(-0.4, -0.1)	0.02	12.3%	12.7%	0.0 (0.1)	(-0.2, 0.2)	0.87
PY 3	14.3%	14.2%	0.2** (0.1)	(0.1, 0.4)	0.02	14.0%	13.9%	0.1 (0.1)	(-0.1, 0.4)	0.33	14.6%	14.6%	0.4** (0.2)	(0.1, 0.6)	0.02
PY 4	14.2%	14.1%	0.2** (0.1)	(0.0, 0.4)	0.04	13.8%	13.7%	0.1 (0.1)	(-0.1, 0.4)	0.35	14.5%	14.6%	0.3* (0.2)	(0.0, 0.6)	0.06
PY 1 through 4	13.2%	13.3%	0.1 (0.1)	(0.0, 0.2)	0.28	12.8%	12.9%	0.0 (0.1)	(-0.2, 0.1)	0.84	13.5%	13.7%	0.2* (0.1)	(0.0, 0.4)	0.09
Percentage of beneficiaries receiving hospice services															
Baseline	2.7%	2.7%	NA	NA	NA	2.7%	2.7%	NA	NA	NA	2.8%	2.7%	NA	NA	NA
PY 1	2.8%	2.7%	0.1* (0.0)	(0.0, 0.1)	0.09	2.7%	2.7%	0.1** (0.0)	(0.0, 0.2)	0.01	2.8%	2.6%	0.0 (0.0)	(-0.1, 0.1)	0.92
PY 2	2.9%	2.8%	0.1** (0.0)	(0.0, 0.1)	0.02	2.9%	2.8%	0.2*** (0.0)	(0.1, 0.2)	0.00	2.9%	2.8%	0.0 (0.1)	(-0.1, 0.1)	0.91
PY 3	3.1%	2.9%	0.1*** (0.0)	(0.1, 0.2)	0.00	3.1%	3.0%	0.2*** (0.0)	(0.1, 0.2)	0.00	3.1%	2.9%	0.1 (0.1)	(0.0, 0.2)	0.13
PY 4	3.3%	3.1%	0.1** (0.0)	(0.0, 0.2)	0.01	3.3%	3.2%	0.1*** (0.0)	(0.1, 0.2)	0.00	3.3%	3.1%	0.1 (0.1)	(0.0, 0.1)	0.36
PY 1 through 4	3.0%	2.9%	0.1*** (0.0)	(0.0, 0.1)	0.00	3.0%	2.9%	0.1*** (0.0)	(0.1, 0.2)	0.00	3.0%	2.9%	0.0 (0.0)	(0.0, 0.1)	0.45
Length of hospice stay, in days (for beneficiaries receiving hospice services)															
Baseline	60	65	NA	NA	NA	60	65	NA	NA	NA	60	66	NA	NA	NA
PY 1	62	66	1.6 (1.0)	(0.0, 3.3)	0.10	62	66	1.3 (1.4)	(-1.1, 3.6)	0.38	62	66	2.1 (1.4)	(-0.3, 4.4)	0.15
PY 2	66	69	2.8** (1.1)	(0.9, 4.6)	0.01	65	68	1.8 (1.5)	(-0.6, 4.2)	0.21	68	70	3.8** (1.7)	(1.0, 6.5)	0.03

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 3	71	73	3.1*** (1.1)	(1.3, 5.0)	0.00	71	72	3.2** (1.5)	(0.8, 5.6)	0.03	72	75	3.0* (1.7)	(0.2, 5.8)	0.08
PY 4	69	70	3.7*** (1.2)	(1.8, 5.7)	0.00	68	69	4.0** (1.6)	(1.3, 6.6)	0.01	70	72	3.3* (1.8)	(0.3, 6.3)	0.07
PY 1 through 4	68	70	2.9*** (0.9)	(1.4, 4.4)	0.00	67	69	2.6** (1.3)	(0.5, 4.7)	0.04	68	71	3.1** (1.4)	(0.8, 5.4)	0.03
Length of hospice stay, in days (for all beneficiaries)															
Baseline	1.6	1.8	NA	NA	NA	1.6	1.8	NA	NA	NA	1.7	1.8	NA	NA	NA
PY 1	1.7	1.8	0.1*** (0.0)	(0.0, 0.1)	0.01	1.7	1.8	0.1** (0.0)	(0.0, 0.2)	0.02	1.7	1.7	0.1 (0.0)	(0.0, 0.1)	0.19
PY 2	1.9	1.9	0.1*** (0.0)	(0.1, 0.2)	0.00	1.9	1.9	0.2*** (0.0)	(0.1, 0.2)	0.00	2.0	2.0	0.1* (0.1)	(0.0, 0.2)	0.07
PY 3	2.2	2.1	0.2*** (0.0)	(0.1, 0.3)	0.00	2.2	2.1	0.2*** (0.1)	(0.1, 0.3)	0.00	2.3	2.2	0.2** (0.1)	(0.0, 0.3)	0.02
PY 4	2.3	2.2	0.2*** (0.0)	(0.1, 0.3)	0.00	2.2	2.1	0.3*** (0.1)	(0.2, 0.4)	0.00	2.3	2.2	0.1** (0.1)	(0.0, 0.3)	0.03
PY 1 through 4	2.0	2.0	0.2*** (0.0)	(0.1, 0.2)	0.00	2.0	2.0	0.2*** (0.0)	(0.1, 0.3)	0.00	2.1	2.0	0.1** (0.0)	(0.0, 0.2)	0.02
Long-term opioid use[f]															
Baseline	8.1%	7.9%	NA	NA	NA	7.8%	7.2%	NA	NA	NA	8.5%	8.7%	NA	NA	NA
PY 1	7.6%	7.4%	0.0 (0.1)	(-0.1, 0.1)	0.54	7.2%	6.8%	-0.1* (0.1)	(-0.2, 0.0)	0.08	7.9%	8.0%	0.2** (0.1)	(0.1, 0.3)	0.02
PY 2	6.8%	6.6%	0.0 (0.1)	(-0.1, 0.1)	0.91	6.5%	6.1%	-0.2** (0.1)	(-0.3, -0.1)	0.02	7.2%	7.2%	0.3*** (0.1)	(0.1, 0.5)	0.00
PY 3	6.1%	6.0%	0.0 (0.1)	(-0.1, 0.1)	0.83	5.8%	5.5%	-0.3*** (0.1)	(-0.5, -0.1)	0.00	6.5%	6.4%	0.4*** (0.1)	(0.2, 0.6)	0.00
PY 4	5.6%	5.5%	-0.2* (0.1)	(-0.3, 0.0)	0.08	5.3%	5.2%	-0.5*** (0.1)	(-0.6, -0.3)	0.00	5.9%	5.9%	0.2 (0.1)	(0.0, 0.4)	0.11
PY 1 through 4	6.5%	6.3%	0.0 (0.1)	(-0.1, 0.1)	0.62	6.1%	5.9%	-0.3*** (0.1)	(-0.4, -0.1)	0.00	6.8%	6.8%	0.3** (0.1)	(0.1, 0.4)	0.01
Potential opioid overuse[g]															
Baseline	19.3%	18.2%	NA	NA	NA	20.0%	18.8%	NA	NA	NA	18.5%	17.7%	NA	NA	NA
PY 1	17.4%	16.2%	0.1 (0.2)	(-0.3, 0.5)	0.58	18.4%	17.2%	0.0 (0.3)	(-0.5, 0.5)	0.91	16.4%	15.3%	0.3 (0.4)	(-0.3, 0.9)	0.43
PY 2	15.5%	14.8%	-0.3 (0.3)	(-0.8, 0.2)	0.26	16.3%	16.3%	-1.2*** (0.4)	(-1.9, -0.6)	0.00	14.7%	13.3%	0.5 (0.4)	(-0.2, 1.3)	0.22
PY 3	13.3%	13.2%	-0.9*** (0.3)	(-1.4, -0.4)	0.01	14.6%	14.5%	-1.1** (0.5)	(-1.8, -0.3)	0.02	12.2%	12.1%	-0.8 (0.5)	(-1.6, 0.0)	0.12
PY 4	12.5%	12.3%	-0.8** (0.4)	(-1.4, -0.2)	0.02	13.9%	13.8%	-1.1** (0.5)	(-1.9, -0.3)	0.03	11.2%	11.0%	-0.6 (0.5)	(-1.5, 0.2)	0.23

Table 5.A.8 *(continued)*

	Track 1—Overall					Track 1—SSP					Track 1—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 1 through 4	14.8%	14.2%	-0.4* (0.3)	(-0.8, 0.0)	0.08	15.9%	15.4%	-0.7** (0.3)	(-1.3, -0.2)	0.02	13.7%	13.0%	-0.1 (0.4)	(-0.7, 0.5)	0.75
Unweighted sample sizes for other quality of care measures															
Number of index discharges for readmission	1,160,596	3,873,092				594,079	2,257,675				566,517	1,615,417			
Number of index ED discharges	2,097,387	7,250,676				1,035,261	4,064,874				1,062,126	3,185,802			
Number of 65 and older Medicare FFS beneficiaries for the high-risk medication measure	899,119	2,996,147				469,155	1,769,270				431,288	1,234,328			
Number of beneficiaries for length of hospice stay	115,559	367,632				58,884	213,176				56,706	154,533			
Number of beneficiaries for long-term opioid use	910,673	3,079,206				469,360	1,799,064				442,634	1,287,948			
Number of beneficiaries for potential opioid overuse	83,294	269,795				40,615	147,567				42,766	122,779			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: For the quality-of-care outcomes, we present the absolute impact estimate only. We do so because percentage impacts for some of the binary outcomes are likely to be misleadingly large, given the low means for the outcome measures.

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources on model implementation.

We grouped the claims-based quality-of-care measures into separate domains according to the Comprehensive Primary Care Functions under which they appear in the 2018 CPC+ Implementation Guide (CMMI 2018).

[a] We report the actual, unadjusted averages in the baseline period which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics and practice fixed effects.

[c] The numbers of Track 1 CPC+ and comparison practices are same as in Tables 5.A.1 and 5.A.6, and hence, are not reported separately in this table. The beneficiary-level measures for recommended services for diabetes, breast cancer screening, and continuity of care are affected only by matching weights (and not by time observed) because the measures require beneficiaries to have full year of

Table 5.A.8 *(continued)*

eligibility in each program year. After accounting for matching weights, the effective sample size for the comparison group for the measures presented in this table is 43 to 52 percent of the size of the actual comparison group.

[d] These measures require that beneficiaries be continuously enrolled in Medicare FFS Parts A and B as well as in Medicare Part D, and not use hospice services during the measurement year.

[e] The continuity of care measures are calculated for beneficiaries who were in the ITT sample at the beginning of the year and were FFS eligible for the full year in each program year and had qualifying ambulatory visits in the program year. Qualifying ambulatory visits are (1) office or other outpatient visit for E&M; (2) ophthalmological services: medical examination and evaluation; and (3) new enrollee and annual wellness visits.

[f] To be included in the analysis of both long-term opioid use and potential overuse, a beneficiary had to: (1) be assigned to a practice; (2) be continuously enrolled in Medicare Parts A, B, and D throughout each calendar year or until death; and (3) have at least one opioid prescription during the measurement year. We further excluded beneficiaries for whom opioid use is appropriate: beneficiaries with a diagnosis of cancer during the measurement year or one year before, or a diagnosis of sickle cell disease or hospice use during the measurement year. The regression models for both opioid use outcomes additionally control for changes in state-level PDMP characteristics and opioid funding.

[g] This measure is defined only among long-term users of opioids.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; FFS = fee-for-service; NA = not applicable; NPI = National Provider Identifier; PDMP = prescription drug monitoring program; PY = Program Year; SE = standard error; SSP = Medicare Shared Savings Program.

D. Aggregate impact estimates for key outcomes

The impact estimates presented above provide evidence on the direction and the magnitude of the likely impact of CPC+ during the first four program years on individual Medicare FFS beneficiaries, on average. For ease of interpretation, it can be useful to translate the beneficiary-level impact estimates to aggregate estimates—for example, the total estimated dollar amount of reduction in Medicare expenditures or the number of outpatient ED visits avoided among Medicare FFS beneficiaries receiving the intervention. Therefore, we present aggregate impact estimates over the first four program years combined across all Medicare FFS beneficiaries assigned to Track 1 practices, for five outcome measures: (1) Medicare expenditures without CMS's enhanced payments, (2) Medicare expenditures including CMS's enhanced payments, (3) number of hospitalizations, (4) number of outpatient ED visits, and (5) 30-day unplanned readmissions. For the first four outcomes, we used the beneficiary-level estimates from the difference-in-differences regressions, together with the total FFS eligible months for beneficiaries assigned to Track 1 practices in PY 1 through PY 4, to obtain the aggregate impact estimates as well as the 90 percent confidence intervals for these estimates. For readmissions, we used the discharge-level estimates and the total discharges for all assigned beneficiaries in Track 1 practices to estimate the aggregate impacts. Consistent with the estimated impacts, the only statistically significant estimates over the first four program years were (1) an increase in Medicare expenditures including CMS's enhanced payments of approximately $631 million, (2) a relative reduction of 9,788 hospitalizations, and (3) a relative reduction of 30,931 outpatient ED visits (Table 5.A.9). There were no effects on Medicare expenditures, excluding CMS's enhanced payments, or on 30-day readmissions.

Table 5.A.9. Aggregate impact estimates for key outcomes over the first four years of CPC+: Track 1

Outcome	Estimate	90 percent CI lower bound	90 percent CI upper bound
Medicare expenditures without CMS's enhanced payments[a]	$78,865,492	-$155,689,997	$313,420,981
Medicare expenditures including CMS's enhanced payments[a]	***$631,158,711***	$398,284,787	$864,032,636
Hospitalizations	***-9,788***	-18,470	-1,106
Outpatient ED visits	***-30,931***	-45,548	-16,313
30-day readmissions[b]	1,874	-103	3,852

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: This table calculates the overall estimated effects on attributed Medicare FFS beneficiaries who were in the intent-to-treat analysis sample in Track 1 practices during the first four years of CPC+. The total number of beneficiaries attributed to Track 1 practices in the annual analysis sample during the intervention period was 1,198,360. These beneficiaries had 32,685,633 eligible beneficiary months and 722,783 eligible index discharges (for readmissions) over the first four years of CPC+. Impact estimates (shown in Tables 5.A.1, 5.A.6, and 5.A.8) are from difference-in-differences regressions using practice fixed effects and patient-level control variables from the pre-CPC+ period. **Yellow shading** ***with bold, italicized text*** signifies that the estimate was statistically significant at the $p < 0.10$ level.

[a] Expenditures for Part A and B services in PY 3 and PY 4 include QPP payment adjustments in 2019 and 2020, which were based on practitioner performance in, respectively, 2017 and 2018. QPP payment adjustments include (1) MIPS adjustments, which were applied directly to physician and outpatient claims in 2019 and 2020 (as a percentage of the charges on the claims), and (2) lump-sum incentive payments, which were paid out to eligible practitioners who participated in Advanced APMs in 2017 and 2018; they were calculated based on applicable physician and outpatient claims for these practitioners in, respectively, 2018 and 2019. Note that the first QPP

Table 5.A.9 *(continued)*

adjustments occurred in 2019 (two years after the start of QPP), so there are no QPP payments in the years before 2019.

[b] In the impact analysis, this outcome represents the percentage of discharges with an unplanned readmission within 30 days of the discharge. For this table, we translated the impact estimate into the total number of discharges for which the initiative affected readmissions.

APM = Alternative Payment Model; CI = confidence interval; CPCP = Comprehensive Primary Care Payment; ED = emergency department; FFS = fee-for-service; QPP = Quality Payment Program.

5.A.2. Results for CPC+ Track 2 Practices

A. Expenditures for Medicare FFS beneficiaries

A.1. Medicare expenditures without CMS's enhanced payments

During the first four program years, for Track 2 practices, CPC+ had no discernible effects on Medicare expenditures without CMS's enhanced payments. For Track 2 practices, these expenditures include base Comprehensive Primary Care Payments (CPCPs). Relative to expenditures among comparison practices, Medicare expenditures without CMS's enhanced payments did not differ for CPC+ Track 2 practices ($0.6 PBPM, 0.1 percent, $p = 0.88$) (Table 5.A.10). Results were mostly similar in sensitivity tests, including when using a triple-difference approach. (See Appendix 5.G and Section A.4 in this appendix for more details.)

Track 2 and comparison practices had similar quarterly trends in Medicare expenditures without CMS's enhanced payments (Figure 5.A.2). For both CPC+ Track 2 and comparison practices, due to the decline in overall health care utilization during the COVID-19 pandemic, there was a similarly sharp drop in expenditures in the first two quarters of 2020, before expenditures returned to pre-pandemic levels in the fourth quarter of 2020.

Table 5.A.10. Regression-adjusted means and estimated impacts of CPC+ on selected Medicare expenditures outcomes for attributed Medicare FFS beneficiaries over the first four program years, Track 2

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Medicare expenditures (per beneficiary per month)																		
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP[d]																		
Baseline	$876	$877	NA	NA	NA	NA	$896	$893	NA	NA	NA	NA	$861	$865	NA	NA	NA	NA
PY 1	$897	$893	$4.9 ($3.5)	0.5%	(-$0.8, $10.6)	0.16	$917	$913	$1.4 ($5.1)	0.2%	(-$7.0, $9.9)	0.78	$881	$877	$7.6 ($4.7)	0.9%	(-$0.2, $15.3)	0.11
PY 2	$949	$945	$5.0 ($4.0)	0.5%	(-$1.6, $11.6)	0.21	$966	$966	-$2.0 ($6.2)	-0.2%	(-$12.3, $8.2)	0.74	$935	$928	$10.5** ($5.2)	1.1%	($1.9, $19.1)	0.04
PY 3	$990	$993	-$2.4 ($4.6)	-0.2%	(-$9.9, $5.2)	0.61	$1,009	$1,014	-$7.5 ($7.2)	-0.7%	(-$19.3, $4.3)	0.30	$974	$976	$1.6 ($5.9)	0.2%	(-$8.1, $11.2)	0.79
PY 4	$939	$943	-$2.9 ($5.1)	-0.3%	(-$11.3, $5.4)	0.57	$949	$960	-$12.8 ($8.1)	-1.3%	(-$26.1, $0.6)	0.12	$930	$927	$7.5 ($6.2)	0.8%	(-$2.6, $17.6)	0.22
PY 1 through 4	$945	$946	$0.6 ($3.6)	0.1%	(-$5.4, $6.5)	0.88	$962	$965	-$5.9 ($5.6)	-0.6%	(-$15.1, $3.4)	0.30	$932	$929	$6.2 ($4.6)	0.7%	(-$1.3, $13.8)	0.18
Medicare Part A and B expenditures including care management fees and comprehensiveness supplement[e]																		
Baseline	$876	$877	NA	NA	NA	NA	$896	$893	NA	NA	NA	NA	$861	$865	NA	NA	NA	NA
PY 1	$923	$893	$31.0*** ($3.5)	3.5%	($25.3, $36.8)	0.00	$943	$913	$27.6*** ($5.2)	3.0%	($19.1, $36.1)	0.00	$907	$877	$33.8*** ($4.7)	3.9%	($26.0, $41.5)	0.00
PY 2	$973	$945	$29.4*** ($4.0)	3.1%	($22.7, $36.0)	0.00	$990	$966	$21.8*** ($6.2)	2.3%	($11.6, $32.1)	0.00	$959	$928	$35.3*** ($5.3)	3.8%	($26.7, $43.9)	0.00
PY 3	$1,013	$993	$21.3*** ($4.6)	2.1%	($13.7, $28.8)	0.00	$1,033	$1,014	$15.8** ($7.2)	1.6%	($4.0, $27.6)	0.03	$998	$976	$25.5*** ($5.9)	2.6%	($15.9, $35.2)	0.00
PY 4	$961	$943	$19.5*** ($5.1)	2.1%	($11.2, $27.9)	0.00	$972	$960	$9.5 ($8.1)	1.0%	(-$3.9, $22.8)	0.24	$953	$927	$30.1*** ($6.2)	3.3%	($19.9, $40.3)	0.00
PY 1 through 4	$969	$946	$24.7*** ($3.6)	2.6%	($18.7, $30.6)	0.00	$986	$965	$18.0*** ($5.6)	1.9%	($8.8, $27.2)	0.00	$956	$929	$30.6*** ($4.6)	3.3%	($23.0, $38.1)	0.00
Medicare Part A and B expenditures including care management fees, comprehensiveness supplement, Performance-based Incentive Payments, and shared savings payments to SSP ACOs[e]																		
Baseline	$879	$880	NA	NA	NA	NA	$901	$899	NA	NA	NA	NA	$861	$865	NA	NA	NA	NA
PY 1	$925	$896	$31.0*** ($3.5)	3.5%	($25.3, $36.7)	0.00	$945	$918	$24.8*** ($5.1)	2.7%	($16.4, $33.2)	0.00	$909	$877	$35.8*** ($4.7)	4.1%	($28.1, $43.5)	0.00
PY 2	$976	$948	$29.7*** ($4.0)	3.1%	($23.2, $36.3)	0.00	$994	$971	$20.5*** ($6.1)	2.1%	($10.5, $30.5)	0.00	$962	$929	$37.0*** ($5.2)	4.0%	($28.4, $45.6)	0.00
PY 3	$1,017	$998	$20.6*** ($4.5)	2.1%	($13.2, $28.0)	0.00	$1,037	$1,022	$13.5* ($7.0)	1.3%	($1.9, $25.0)	0.05	$1,001	$979	$26.1*** ($5.8)	2.7%	($16.5, $35.7)	0.00
PY 4	$968	$951	$18.5*** ($5.0)	1.9%	($10.2, $26.8)	0.00	$982	$972	$7.4 ($7.9)	0.8%	(-$5.7, $20.4)	0.35	$958	$931	$30.2*** ($6.2)	3.3%	($20.0, $40.3)	0.00
PY 1 through 4	$973	$950	$24.3*** ($3.6)	2.6%	($18.4, $30.2)	0.00	$991	$973	$15.9*** ($5.4)	1.6%	($7.0, $24.9)	0.00	$959	$931	$31.6*** ($4.6)	3.4%	($24.0, $39.1)	0.00

Table 5.A.10 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Medicare expenditures by service category (per beneficiary per month)[f]																		
Inpatient expenditures																		
Baseline	$314	$317	NA	NA	NA	NA	$322	$322	NA	NA	NA	NA	$308	$312	NA	NA	NA	NA
PY 1	$321	$320	$3.4 ($2.3)	1.1%	(-$0.3, $7.2)	0.13	$329	$329	$0.6 ($3.4)	0.2%	(-$5.0, $6.3)	0.85	$314	$313	$5.7* ($3.1)	1.8%	($0.6, $10.7)	0.07
PY 2	$329	$329	$2.3 ($2.5)	0.7%	(-$1.8, $6.4)	0.36	$335	$337	-$1.8 ($3.8)	-0.5%	(-$8.1, $4.5)	0.65	$323	$322	$5.5* ($3.3)	1.7%	($0.1, $10.9)	0.10
PY 3	$336	$344	-$5.5** ($2.6)	-1.6%	(-$9.9, -$1.2)	0.04	$344	$351	-$7.0* ($4.0)	-2.0%	(-$13.6, -$0.5)	0.08	$329	$338	-$4.4 ($3.5)	-1.3%	(-$10.1, $1.2)	0.20
PY 4	$318	$323	-$2.7 ($2.9)	-0.9%	(-$7.6, $2.1)	0.35	$325	$331	-$5.6 ($4.7)	-1.7%	(-$13.3, $2.0)	0.23	$313	$316	$1.1 ($3.6)	0.3%	(-$4.9, $7.0)	0.77
PY 1 through 4	$326	$329	-$0.9 ($2.1)	-0.3%	(-$4.4, $2.7)	0.69	$334	$337	-$3.7 ($3.3)	-1.1%	(-$9.1, $1.7)	0.26	$320	$323	$1.7 ($2.8)	0.5%	(-$2.8, $6.2)	0.54
Expenditures for acute inpatient care[g]																		
Baseline	$278	$281	NA	NA	NA	NA	$286	$285	NA	NA	NA	NA	$271	$278	NA	NA	NA	NA
PY 1	$284	$285	$2.6 ($2.1)	0.9%	(-$0.7, $6.0)	0.20	$293	$292	-$0.6 ($3.1)	-0.2%	(-$5.7, $4.6)	0.85	$278	$279	$5.2* ($2.7)	1.9%	($0.7, $9.7)	0.06
PY 2	$292	$294	$0.7 ($2.2)	0.3%	(-$3.0, $4.4)	0.75	$298	$300	-$3.3 ($3.5)	-1.1%	(-$9.1, $2.5)	0.35	$287	$289	$3.9 ($2.9)	1.4%	(-$0.8, $8.6)	0.17
PY 3	$298	$309	-$7.0*** ($2.4)	-2.3%	(-$10.9, -$3.1)	0.00	$307	$314	-$8.7** ($3.6)	-2.8%	(-$14.7, -$2.8)	0.02	$292	$304	-$5.7* ($3.1)	-1.9%	(-$10.8, -$0.7)	0.06
PY 4	$282	$290	-$5.3** ($2.6)	-1.8%	(-$9.6, -$1.0)	0.04	$289	$296	-$7.6* ($4.1)	-2.5%	(-$14.4, -$0.7)	0.07	$276	$285	-$2.1 ($3.2)	-0.8%	(-$7.4, $3.2)	0.51
PY 1 through 4	$289	$295	-$2.4 ($1.9)	-0.8%	(-$5.6, $0.7)	0.21	$297	$301	-$5.2* ($3.0)	-1.7%	(-$10.2, -$0.3)	0.08	$283	$289	$0.1 ($2.5)	0.0%	(-$3.9, $4.1)	0.97
Inpatient rehabilitation facility expenditures																		
Baseline	$20	$20	NA	NA	NA	NA	$20	$22	NA	NA	NA	NA	$20	$20	NA	NA	NA	NA
PY 1	$22	$21	$0.8* ($0.4)	3.9%	($0.1, $1.5)	0.06	$22	$22	$0.9 ($0.6)	4.3%	(-$0.1, $1.9)	0.16	$21	$20	$0.7 ($0.6)	3.6%	(-$0.2, $1.7)	0.19
PY 2	$22	$22	$1.3*** ($0.5)	6.2%	($0.5, $2.1)	0.01	$23	$23	$0.8 ($0.8)	3.6%	(-$0.5, $2.0)	0.30	$22	$21	$1.7*** ($0.6)	8.3%	($0.7, $2.8)	0.01
PY 3	$23	$22	$1.3** ($0.5)	5.8%	($0.4, $2.1)	0.01	$23	$23	$0.8 ($0.8)	3.6%	(-$0.5, $2.1)	0.31	$23	$21	$1.6** ($0.7)	7.6%	($0.5, $2.7)	0.02
PY 4	$23	$21	$2.1*** ($0.6)	10.1%	($1.2, $3.0)	0.00	$23	$22	$1.4 ($0.9)	6.6%	(-$0.1, $2.9)	0.12	$23	$20	$2.7*** ($0.7)	13.3%	($1.6, $3.8)	0.00
PY 1 through 4	$23	$22	$1.3*** ($0.4)	6.3%	($0.7, $2.0)	0.00	$23	$23	$0.9 ($0.6)	4.3%	(-$0.1, $2.0)	0.14	$23	$21	$1.7*** ($0.5)	8.0%	($0.8, $2.5)	0.00
Outpatient expenditures																		
Baseline	$166	$170	NA	NA	NA	NA	$175	$166	NA	NA	NA	NA	$160	$173	NA	NA	NA	NA

Table 5.A.10 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 1	$178	$181	$0.9 ($0.9)	0.5%	(-$0.5, $2.3)	0.31	$187	$177	$1.5 ($1.3)	0.8%	(-$0.7, $3.7)	0.26	$171	$184	$0.4 ($1.1)	0.2%	(-$1.5, $2.2)	0.74
PY 2	$199	$203	$0.2 ($1.2)	0.1%	(-$1.8, $2.2)	0.86	$209	$200	$0.5 ($2.0)	0.3%	(-$2.8, $3.9)	0.79	$192	$205	$0.0 ($1.5)	0.0%	(-$2.5, $2.4)	0.98
PY 3	$214	$219	-$1.3 ($1.7)	-0.6%	(-$4.0, $1.4)	0.44	$225	$218	-$1.7 ($2.9)	-0.7%	(-$6.4, $3.1)	0.56	$205	$220	-$1.0 ($1.8)	-0.5%	(-$4.0, $2.0)	0.59
PY 4	$203	$212	-$5.0*** ($1.8)	-2.4%	(-$8.0, -$2.0)	0.01	$210	$208	-$6.3** ($3.1)	-2.9%	(-$11.4, -$1.3)	0.04	$197	$214	-$3.5* ($2.0)	-1.8%	(-$6.9, -$0.2)	0.08
PY 1 through 4	$199	$205	-$1.5 ($1.2)	-0.7%	(-$3.5, $0.5)	0.22	$209	$202	-$1.7 ($2.1)	-0.8%	(-$5.1, $1.7)	0.41	$192	$207	-$1.2 ($1.4)	-0.6%	(-$3.4, $1.0)	0.38
Expenditures for outpatient ED visits, including observation stays[h]																		
Baseline	$25	$26	NA	NA	NA	NA	$25	$27	NA	NA	NA	NA	$26	$26	NA	NA	NA	NA
PY 1	$27	$27	-$0.1 ($0.2)	-0.2%	(-$0.4, $0.3)	0.78	$26	$28	-$0.3 ($0.3)	-1.2%	(-$0.8, $0.1)	0.25	$27	$27	$0.2 ($0.2)	0.6%	(-$0.2, $0.6)	0.50
PY 2	$28	$29	-$0.2 ($0.2)	-0.8%	(-$0.6, $0.1)	0.30	$28	$30	-$0.3 ($0.4)	-1.0%	(-$0.9, $0.3)	0.45	$29	$29	-$0.2 ($0.3)	-0.7%	(-$0.7, $0.3)	0.49
PY 3	$29	$30	-$0.3 ($0.3)	-1.1%	(-$0.8, $0.1)	0.23	$28	$31	-$0.8* ($0.4)	-2.8%	(-$1.5, -$0.1)	0.06	$30	$30	$0.1 ($0.3)	0.3%	(-$0.5, $0.6)	0.79
PY 4	$24	$26	-$0.7** ($0.3)	-2.8%	(-$1.2, -$0.2)	0.01	$23	$26	-$1.2*** ($0.5)	-5.0%	(-$2.0, -$0.5)	0.01	$25	$25	-$0.2 ($0.3)	-0.7%	(-$0.7, $0.4)	0.58
PY 1 through 4	$27	$28	-$0.4* ($0.2)	-1.3%	(-$0.7, $0.0)	0.08	$26	$28	-$0.7** ($0.3)	-2.6%	(-$1.2, -$0.2)	0.03	$28	$28	-$0.1 ($0.3)	-0.2%	(-$0.5, $0.4)	0.81
Expenditures for physician and nonphysician Part B noninstitutional services in any setting[i]																		
Baseline	$245	$239	NA	NA	NA	NA	$248	$250	NA	NA	NA	NA	$243	$230	NA	NA	NA	NA
PY 1	$251	$244	$0.0 ($0.8)	0.0%	(-$1.3, $1.2)	0.95	$251	$255	-$2.0* ($1.1)	-0.8%	(-$3.9, -$0.2)	0.07	$250	$235	$1.5 ($1.0)	0.6%	(-$0.2, $3.2)	0.16
PY 2	$265	$258	$0.1 ($1.1)	0.1%	(-$1.7, $2.0)	0.90	$265	$271	-$3.3* ($1.8)	-1.2%	(-$6.2, -$0.4)	0.06	$265	$249	$2.8** ($1.4)	1.1%	($0.6, $5.1)	0.04
PY 3	$278	$271	$0.6 ($1.4)	0.2%	(-$1.7, $2.9)	0.65	$278	$283	-$2.8 ($2.3)	-1.0%	(-$6.6, $0.9)	0.21	$279	$262	$3.4* ($1.7)	1.2%	($0.5, $6.2)	0.05
PY 4	$259	$250	$2.8* ($1.6)	1.1%	($0.2, $5.4)	0.07	$257	$260	-$1.3 ($2.3)	-0.5%	(-$5.1, $2.5)	0.57	$262	$242	$6.2*** ($2.0)	2.4%	($2.9, $9.5)	0.00
PY 1 through 4	$264	$257	$0.8 ($1.1)	0.3%	(-$1.0, $2.5)	0.46	$263	$268	-$2.4 ($1.7)	-0.9%	(-$5.2, $0.4)	0.15	$264	$248	$3.3** ($1.3)	1.3%	($1.1, $5.5)	0.01
Expenditures for ambulatory visits with primary care practitioners																		
Baseline	$24	$24	NA	NA	NA	NA	$24	$25	NA	NA	NA	NA	$24	$24	NA	NA	NA	NA
PY 1	$25	$25	$0.1 ($0.1)	0.4%	(-$0.1, $0.3)	0.34	$25	$26	$0.2* ($0.1)	1.0%	($0.0, $0.5)	0.08	$25	$25	$0.0 ($0.1)	-0.1%	(-$0.2, $0.2)	0.87

Table 5.A.10 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 2	$27	$26	$1.0*** ($0.1)	3.9%	($0.8, $1.2)	0.00	$27	$26	$1.1*** ($0.2)	4.3%	($0.8, $1.4)	0.00	$27	$26	$0.9*** ($0.2)	3.6%	($0.6, $1.2)	0.00
PY 3	$28	$27	$1.2*** ($0.2)	4.3%	($0.9, $1.5)	0.00	$28	$28	$1.3*** ($0.2)	4.8%	($0.9, $1.7)	0.00	$28	$27	$1.1*** ($0.2)	4.0%	($0.7, $1.5)	0.00
PY 4	$26	$24	$2.3*** ($0.2)	9.5%	($2.0, $2.6)	0.00	$26	$24	$2.5*** ($0.3)	10.9%	($2.1, $3.0)	0.00	$26	$24	$2.1*** ($0.2)	8.7%	($1.7, $2.5)	0.00
PY 1 through 4	$27	$26	$1.2*** ($0.1)	4.6%	($0.9, $1.4)	0.00	$26	$26	$1.3*** ($0.2)	5.2%	($1.0, $1.6)	0.00	$27	$25	$1.0*** ($0.2)	4.1%	($0.8, $1.3)	0.00
Expenditures for ambulatory visits with primary care practitioners at assigned practice[j]																		
Baseline	$17	$17	NA	NA	NA	NA	$17	$17	NA	NA	NA	NA	$17	$16	NA	NA	NA	NA
PY 1	$17	$17	$0.3** ($0.1)	1.6%	($0.1, $0.5)	0.01	$17	$17	$0.4*** ($0.1)	2.4%	($0.2, $0.7)	0.00	$17	$16	$0.2 ($0.2)	1.0%	(-$0.1, $0.4)	0.28
PY 2	$17	$15	$1.5*** ($0.1)	10.1%	($1.3, $1.8)	0.00	$17	$15	$1.7*** ($0.2)	11.4%	($1.4, $2.1)	0.00	$17	$14	$1.4*** ($0.2)	9.1%	($1.1, $1.7)	0.00
PY 3	$17	$15	$1.7*** ($0.3)	11.0%	($1.2, $2.2)	0.00	$17	$15	$2.1*** ($0.3)	14.0%	($1.7, $2.6)	0.00	$17	$15	$1.4*** ($0.5)	8.8%	($0.6, $2.2)	0.00
PY 4	$15	$12	$2.6*** ($0.3)	20.6%	($2.1, $3.0)	0.00	$15	$12	$3.1*** ($0.3)	26.4%	($2.6, $3.6)	0.00	$15	$12	$2.3*** ($0.4)	17.5%	($1.6, $3.0)	0.00
PY 1 through 4	$17	$15	$1.6*** ($0.2)	10.4%	($1.2, $1.9)	0.00	$17	$15	$1.9*** ($0.2)	12.8%	($1.5, $2.2)	0.00	$17	$14	$1.3*** ($0.3)	8.6%	($0.8, $1.8)	0.00
Expenditures for ambulatory visits with primary care practitioners at non-assigned practice[j]																		
Baseline	$7	$8	NA	NA	NA	NA	$7	$8	NA	NA	NA	NA	$7	$8	NA	NA	NA	NA
PY 1	$8	$9	-$0.2*** ($0.1)	-2.4%	(-$0.3, -$0.1)	0.00	$8	$8	-$0.2* ($0.1)	-2.3%	(-$0.3, $0.0)	0.07	$8	$9	-$0.2** ($0.1)	-2.4%	(-$0.3, $0.0)	0.03
PY 2	$10	$11	-$0.5*** ($0.1)	-5.3%	(-$0.7, -$0.4)	0.00	$10	$11	-$0.6*** ($0.2)	-6.1%	(-$0.9, -$0.4)	0.00	$10	$11	-$0.5*** ($0.1)	-4.7%	(-$0.7, -$0.3)	0.00
PY 3	$11	$12	-$0.5** ($0.2)	-4.8%	(-$0.9, -$0.2)	0.02	$11	$12	-$0.8*** ($0.2)	-7.0%	(-$1.1, -$0.5)	0.00	$11	$12	-$0.3 ($0.4)	-3.0%	(-$1.0, $0.3)	0.40
PY 4	$11	$12	-$0.3 ($0.2)	-2.7%	(-$0.7, $0.1)	0.18	$11	$12	-$0.5** ($0.2)	-4.7%	(-$0.9, -$0.1)	0.02	$11	$12	-$0.2 ($0.4)	-1.6%	(-$0.8, $0.4)	0.62
PY 1 through 4	$10	$11	-$0.4*** ($0.2)	-3.9%	(-$0.7, -$0.2)	0.01	$10	$11	-$0.6*** ($0.1)	-5.4%	(-$0.8, -$0.3)	0.00	$10	$11	-$0.3 ($0.2)	-2.8%	(-$0.7, $0.1)	0.24
Expenditures for ambulatory visits with specialists																		
Baseline	$24	$24	NA	NA	NA	NA	$26	$25	NA	NA	NA	NA	$23	$22	NA	NA	NA	NA
PY 1	$24	$23	$0.0 ($0.1)	-0.2%	(-$0.1, $0.1)	0.53	$25	$25	-$0.1 ($0.1)	-0.4%	(-$0.3, $0.1)	0.36	$23	$22	$0.0 ($0.1)	0.0%	(-$0.1, $0.1)	0.95
PY 2	$24	$24	-$0.1 ($0.1)	-0.5%	(-$0.3, $0.0)	0.14	$25	$25	-$0.3** ($0.1)	-1.4%	(-$0.6, -$0.1)	0.01	$23	$22	$0.0 ($0.1)	0.2%	(-$0.1, $0.2)	0.65
PY 3	$24	$24	-$0.2** ($0.1)	-0.9%	(-$0.4, -$0.1)	0.03	$25	$26	-$0.5*** ($0.2)	-2.0%	(-$0.8, -$0.3)	0.00	$24	$23	$0.0 ($0.1)	0.0%	(-$0.2, $0.2)	0.93

Table 5.A.10 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
PY 4	$21	$20	-$0.2** ($0.1)	-1.1%	(-$0.4, $0.0)	0.04	$22	$22	-$0.5*** ($0.2)	-2.2%	(-$0.8, -$0.2)	0.01	$20	$19	$0.0 ($0.1)	0.1%	(-$0.2, $0.3)	0.89
PY 1 through 4	$23	$23	-$0.2** ($0.1)	-0.7%	(-$0.3, $0.0)	0.04	$24	$24	-$0.4*** ($0.1)	-1.5%	(-$0.6, -$0.2)	0.00	$23	$22	$0.0 ($0.1)	0.1%	(-$0.2, $0.2)	0.91
Skilled nursing facility expenditures																		
Baseline	$65	$64	NA	NA	NA	NA	$69	$69	NA	NA	NA	NA	$62	$60	NA	NA	NA	NA
PY 1	$63	$62	$0.1 ($0.7)	0.1%	(-$1.1, $1.3)	0.93	$67	$66	$1.0 ($1.1)	1.5%	(-$0.8, $2.7)	0.36	$60	$59	-$0.7 ($1.0)	-1.2%	(-$2.4, $1.0)	0.49
PY 2	$64	$63	$0.5 ($0.8)	0.8%	(-$0.8, $1.8)	0.52	$68	$66	$1.4 ($1.1)	2.1%	(-$0.5, $3.3)	0.22	$61	$60	-$0.3 ($1.0)	-0.4%	(-$2.0, $1.4)	0.80
PY 3	$63	$62	$0.3 ($0.9)	0.5%	(-$1.1, $1.7)	0.72	$67	$66	$0.9 ($1.3)	1.4%	(-$1.2, $3.0)	0.48	$60	$59	-$0.2 ($1.2)	-0.3%	(-$2.1, $1.8)	0.87
PY 4	$63	$62	$0.4 ($1.0)	0.6%	(-$1.3, $2.0)	0.71	$65	$66	-$0.5 ($1.5)	-0.8%	(-$2.9, $1.9)	0.72	$61	$58	$1.3 ($1.3)	2.2%	(-$0.9, $3.5)	0.32
PY 1 through 4	$63	$62	$0.3 ($0.7)	0.4%	(-$0.9, $1.4)	0.71	$67	$66	$0.6 ($1.0)	0.9%	(-$1.1, $2.3)	0.55	$61	$59	$0.0 ($0.9)	0.0%	(-$1.5, $1.6)	0.98
Home health expenditures																		
Baseline	$41	$41	NA	NA	NA	NA	$41	$44	NA	NA	NA	NA	$41	$40	NA	NA	NA	NA
PY 1	$40	$41	-$0.4 ($0.3)	-0.9%	(-$0.9, $0.2)	0.28	$40	$43	-$0.1 ($0.5)	-0.2%	(-$0.8, $0.6)	0.83	$41	$40	-$0.6 ($0.5)	-1.3%	(-$1.3, $0.2)	0.22
PY 2	$41	$42	-$0.8** ($0.4)	-1.8%	(-$1.4, -$0.2)	0.03	$40	$45	-$0.9* ($0.5)	-2.1%	(-$1.7, -$0.1)	0.08	$41	$41	-$0.7 ($0.5)	-1.6%	(-$1.5, $0.2)	0.18
PY 3	$41	$42	-$1.1** ($0.4)	-2.6%	(-$1.8, -$0.4)	0.01	$40	$44	-$0.4 ($0.6)	-0.9%	(-$1.3, $0.6)	0.53	$41	$41	-$1.7*** ($0.6)	-3.9%	(-$2.7, -$0.6)	0.01
PY 4	$36	$39	-$1.9*** ($0.4)	-5.0%	(-$2.6, -$1.2)	0.00	$35	$40	-$2.2*** ($0.7)	-6.0%	(-$3.3, -$1.1)	0.00	$37	$37	-$1.5** ($0.6)	-3.8%	(-$2.4, -$0.5)	0.01
PY 1 through 4	$39	$41	-$1.1*** ($0.3)	-2.6%	(-$1.6, -$0.5)	0.00	$39	$43	-$0.9** ($0.5)	-2.3%	(-$1.7, -$0.2)	0.04	$40	$40	-$1.1** ($0.5)	-2.7%	(-$1.9, -$0.4)	0.02
Hospice expenditures																		
Baseline	$24	$25	NA	NA	NA	NA	$22	$23	NA	NA	NA	NA	$25	$27	NA	NA	NA	NA
PY 1	$24	$25	$0.6 ($0.4)	2.7%	(-$0.1, $1.3)	0.13	$23	$24	$0.4 ($0.6)	1.7%	(-$0.6, $1.4)	0.52	$25	$26	$0.8 ($0.6)	3.4%	(-$0.1, $1.8)	0.14
PY 2	$28	$27	$2.4*** ($0.5)	9.2%	($1.5, $3.2)	0.00	$26	$26	$2.0** ($0.8)	8.1%	($0.7, $3.3)	0.01	$29	$28	$2.7*** ($0.7)	10.1%	($1.5, $3.9)	0.00
PY 3	$31	$30	$3.0*** ($0.6)	10.7%	($2.0, $4.0)	0.00	$30	$28	$3.2*** ($0.9)	12.0%	($1.8, $4.7)	0.00	$32	$31	$2.9*** ($0.8)	9.7%	($1.6, $4.2)	0.00
PY 4	$33	$32	$2.1*** ($0.6)	6.9%	($1.1, $3.2)	0.00	$32	$31	$2.5*** ($0.9)	8.3%	($1.0, $3.9)	0.01	$34	$34	$2.0** ($0.9)	6.2%	($0.6, $3.4)	0.02
PY 1 through 4	$29	$29	$2.0*** ($0.5)	7.3%	($1.3, $2.8)	0.00	$28	$27	$2.0*** ($0.7)	7.6%	($0.8, $3.1)	0.00	$30	$30	$2.0*** ($0.6)	7.2%	($1.0, $3.1)	0.00

Table 5.A.10 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90 percent confidence interval	*p*-Value
Durable medical equipment expenditures																		
Baseline	$21	$21	NA	NA	NA	NA	$20	$20	NA	NA	NA	NA	$21	$22	NA	NA	NA	NA
PY 1	$20	$20	$0.3 ($0.2)	1.5%	(-$0.1, $0.7)	0.23	$19	$19	$0.1 ($0.3)	0.3%	(-$0.5, $0.6)	0.86	$20	$20	$0.5 ($0.3)	2.4%	(-$0.1, $1.0)	0.16
PY 2	$23	$22	$0.3 ($0.3)	1.2%	(-$0.2, $0.7)	0.36	$22	$22	$0.0 ($0.5)	-0.1%	(-$0.8, $0.7)	0.95	$23	$23	$0.5 ($0.4)	2.2%	(-$0.1, $1.1)	0.18
PY 3	$24	$24	$0.5 ($0.3)	2.2%	($0.0, $1.0)	0.11	$24	$23	$0.1 ($0.5)	0.6%	(-$0.7, $1.0)	0.77	$25	$24	$0.8** ($0.4)	3.3%	($0.1, $1.5)	0.05
PY 4	$25	$25	$0.6* ($0.3)	2.5%	($0.1, $1.2)	0.06	$25	$24	$0.6 ($0.5)	2.3%	(-$0.3, $1.4)	0.28	$26	$25	$0.7 ($0.4)	2.9%	($0.0, $1.4)	0.11
PY 1 through 4	$23	$23	$0.4 ($0.3)	1.8%	($0.0, $0.8)	0.11	$23	$22	$0.2 ($0.4)	0.7%	(-$0.5, $0.8)	0.69	$24	$23	$0.6* ($0.3)	2.6%	($0.1, $1.2)	0.07
Unweighted sample sizes[k]																		
Number of practices	1,515	3,783					636	1,817					879	1,966				
Number of beneficiaries	1,762,047	4,173,931					788,310	2,088,824					977,592	2,096,364				
Number of beneficiary-years	5,920,967	13,908,971					2,626,614	6,959,723					3,294,353	6,949,248				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] We report the actual, unadjusted averages in the baseline period, which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference in the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ compared to the average outcome in the baseline year relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices while controlling for beneficiary characteristics and practice fixed-effects.

[c] We calculated percentage impacts relative to what the CPC+ mean would have been in PY 1 through PY 4 (separately and combined) in the absence of the intervention; that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Expenditures for Part A and B services in PY 3 and PY 4 include QPP payment adjustments based on practitioner performance two years earlier. They are applicable for both CPC+ and comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims), and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on, respectively, 2018 and 2019 claims for these practitioners). The first QPP adjustments were paid in PY 3 (two years after the start of QPP), so there are no QPP payments in PY 1 or PY 2. Medicare Part A and B expenditures *without* enhanced payments include the base CPCPs, but not the 10 percent comprehensiveness supplement. We include CPCPs in Part B spending because Track 2 practices agreed to lower Part B payments for evaluation and management services in exchange for CPCPs.

Table 5.A.10 *(continued)*

[e] Medicare Part A and B expenditures *with* enhanced payments include the base CPCPs as well as the 10 percent comprehensiveness supplement. We determine SSP ACO participation status based on participation at the beginning of PY 1 (January 1, 2017). However, over time, CPC+ practices may join or leave the SSP, resulting in a small subset of SSP practices that receive the Performance-based Incentive Payments and a small subset of non-SSP practices that receive the shared savings payments. This is reflected in the impact estimates.

[f] The sum of expenditures by service category does not equal the total expenditures for Part A and B services without enhanced payments in PY 3 and PY 4 because the total expenditures include lump-sum incentive payments that are not applied at the claim level but instead paid out directly to eligible practitioners who participated in Advanced APMs in 2017 and 2018.

[g] Acute inpatient care includes short-stay acute hospital admissions and admissions to CAHs. Expenditures for non-acute hospital admissions other than those for inpatient rehabilitation, such as psychiatric hospital admissions, are included in inpatient expenditures and not shown separately.

[h] Expenditures on outpatient ED visits, with QPP payment adjustments, include professional and facility fees (which are part of expenditures for physician and nonphysician Part B noninstitutional services) as well as payments for observation stays.

[i] Expenditures on Part B noninstitutional services, with QPP payment adjustments, include expenditures for (1) primary care ambulatory visits, (2) ambulatory visits to specialists, and (3) non-ambulatory physician visits as well as services provided by other noninstitutional providers (we show only the first two categories separately in the table).

[j] We define the assigned practice for the baseline period as the first practice to which a beneficiary was attributed during the baseline period, and the assigned practice for the intervention period as the first practice that the beneficiary was attributed to during the intervention period.

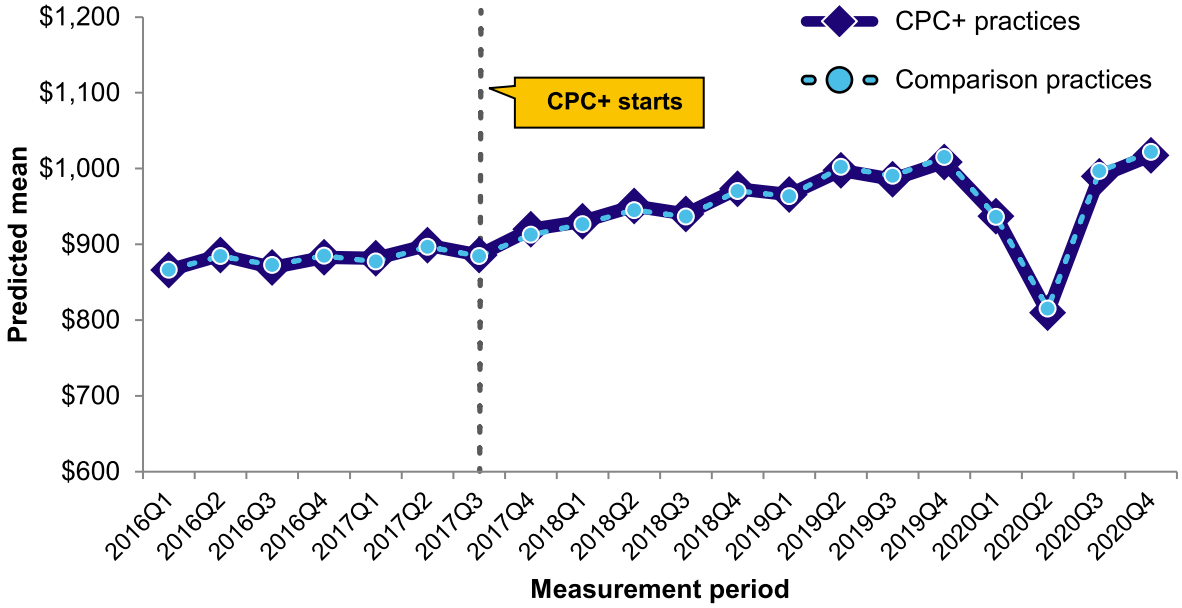
[k] After accounting for weights that adjust for matching and time observed in Medicare FFS, the effective sample sizes decrease but are still substantial. For the comparison group, the effective sample size is 38 to 43 percent of the actual sample size. For the CPC+ group, the effective sample size is about 96 percent of the actual sample size; this is because the CPC+ group is affected only by time observed (and not by the matching weights).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

NA = not applicable because the difference-in-differences impact estimate cannot be calculated at baseline.

ACO = Accountable Care Organization; APM = Alternative Payment Model; C = comparison; CAH = Critical Access Hospital; ED = emergency department; FFS = fee-for-service; MIPS = Merit-based Incentive Payment System; PY = Program Year; QPP = Quality Payment Program; SE = standard error; SSP = Medicare Shared Savings Program.

Figure 5.A.2. Quarterly trends in average Medicare Part A and B expenditures PBPM, excluding CMS's enhanced payments, Track 2



Source: Analyses of Medicare claims data from January 2013 through December 2020.

Notes: For beneficiaries attributed to CPC+ and comparison practices, the figure shows actual, unadjusted average expenditures in the baseline quarters (Q1 through Q4 of 2016), which are similar for the two groups due to matching. In the intervention quarters (starting in Q1 2017), the comparison group mean is regression-adjusted based on the quarterly difference-in-differences model, which adjusts for baseline characteristics. Medicare expenditures without CMS's enhanced payments include base Comprehensive Primary Care Payments (CPCPs) for Track 2 practices. The sharp decline in expenditures during the first and second quarters of 2020 can be attributed to the decline in the overall utilization of health services during the initial months of the COVID-19 pandemic.

PBPM = per beneficiary per month.

The estimated effects on expenditures without enhanced payments differed for Track 2 SSP and Track 2 non-SSP practices. In particular, the estimated effects on expenditures were in opposite directions in PY4, implying decreases for Track 2 SSP practices (-$12.8 PBPM, -1.3 percent, $p = 0.12$) and increases for Track 2 non-SSP practices ($7.5 PBPM, 0.8 percent, $p = 0.22$). While neither of these estimates were significantly different from zero, they were statistically significantly different from each other ($p = 0.05$ for the difference by SSP subgroup). As described in Subsection A.2, there were differences by SSP status in PY 4 estimates for physician and nonphysician Part B noninstitutional service expenditures and for acute and rehabilitation inpatient expenditures; these differences (some of which should be interpreted with caution as described below) explain the overall differences in expenditures by SSP status. The triple-differences estimates in PY 4 were similar to the difference-in-differences estimates, with opposing direction of estimates by SSP status, but no statistically significant estimates in either SSP group, given the wider confidence intervals around the triple-differences estimates.

A.2. Medicare expenditures by service category

A lack of meaningful effects on the largest expenditure categories explains the lack of effects on total Medicare expenditures. Across the four program years, totals for inpatient expenditures, physician and non-physician Part B noninstitutional service expenditures, and outpatient expenditures changed similarly for Track 2 and comparison practices. These expenditure categories are the three largest; they account for, respectively, 35 percent, 29 percent, and 19 percent of total Medicare expenditures at baseline. CPC+ Track 2 reduced acute inpatient expenditures in PY 3 and PY 4 but did not significantly reduce acute inpatient expenditures across the four program years. Over the four program years, CPC+ Track 2 reduced home health expenditures by about $1 PBPM and reduced expenditures on both outpatient ED visits and ambulatory visits with specialists by less than $0.5 PBPM each; however, there were offsetting increases in expenditures for hospice, ambulatory visits with primary care practitioners, and inpatient rehabilitation facilities.

Specifically, CPC+ reduced expenditures on:

- **Acute inpatient services. CPC+ Track 2 reduced expenditures on acute inpatient care by 2 percent in both PY 3 and PY 4, led by stronger reductions among SSP practices.** CPC+ Track 2 reduced expenditures by $7 PBPM in PY 3 (-2.3 percent, $p < 0.01$) and by $5.3 PBPM in PY 4 (-1.8 percent, $p = 0.04$). In PY 3, there were statistically significant reductions among both SSP and non-SSP practices, but in PY 4, there were reductions only in the SSP group (-$7.6 PBPM, -2.5 percent, $p = 0.07$) though differences by SSP group were not statistically significant ($p = 0.30$ for the differences by SSP subgroup in PY 4). These reductions in acute inpatient expenditures are consistent with reductions in acute hospitalizations; however, changes in acute hospitalizations did not align well with the changes in acute inpatient expenditures by subgroup: there were larger reductions in acute hospitalizations among non-SSP practices (see Section B and Table 5.A.15 for more details).[30] Despite the reductions in expenditures on acute inpatient care in PY 3 and PY 4, the average annual estimate over the first four years of CPC+ Track 2 was less than 1 percent and not statistically significant (-0.8 percent, -$2.4 PBPM, $p = 0.21$).
- **Home health. CPC+ Track 2 reduced expenditures on home health by 3 percent.** Similar to our findings for Track 1, there was a 2.6 percent relative decrease in home health expenditures (-$1.1 PBPM, $p < 0.01$) for Track 2 that first emerged in PY 2 and continued through PY 4, with annual estimated reductions growing from 1.8 percent (-$0.8 PBPM, $p = 0.03$) in PY 2 to 5.0 percent (-$1.9 PBPM, $p < 0.01$) in PY 4. In each of the four program years, the estimated reductions were similar by SSP status.
- **Outpatient ED visits. CPC+ Track 2 was also associated with a 1 percent relative decrease in expenditures for outpatient ED visits, emerging in PY 4**. The estimated reduction in outpatient ED expenditures of $0.7 PBPM (-2.8 percent, $p = 0.01$) in PY 4 was driven by a statistically significant reduction in the Track 2 SSP group (-$1.2 PBPM, -5 percent, $p < 0.01$) which differed significantly from the estimate for non-SSP group ($p = 0.07$ for the difference by SSP subgroup). This is consistent with the reduction in the number of

[30] However, it should be noted that the SSP and non-SSP estimates for reductions in acute hospitalizations and inpatient expenditures were not statistically different from each other in Track 2 in both PY 3 and PY 4.

outpatient ED visits among SSP practices in PY 4 (see Section B). The statistically significant estimate of outpatient ED expenditures in PY 4 contributed to an overall average annual decrease of $0.4 PBPM in these expenditures (-1.3 percent, $p = 0.08$) among Track 2 practices. In PY 4, CPC+ was also associated with a $5 PBPM decrease in total outpatient expenditures (-2.4 percent, $p < 0.01$). The magnitude of the PY 4 findings (for expenditures on outpatient ED visits and total outpatient expenditures) should be interpreted cautiously for two reasons. First, the estimated reduction in outpatient ED visit expenditures (particularly the 5 percent relative reduction in the SSP subgroup) was larger than expected given the trends in previous years. Second, the difference-in-differences estimate in PY 4 was larger than the highest reduction implied by the 90 percent confidence interval around the triple-differences estimate.[31]

- **Ambulatory visits with specialists. Expenditures for ambulatory visits with specialists decreased by about 1 percent more among Track 2 practices relative to comparison practices, due to decreases among SSP practices**. There was a $0.2 PBPM (-0.7 percent, $p = 0.04$) average annual relative reduction in ambulatory visits with specialists; this was driven entirely by a $0.4 PBPM (-1.5 percent, $p < 0.01$) relative reduction among Track 2 SSP practices. This reduction emerged in PY 2 for SSP practices and continued through PY 4. In contrast, the estimate was effectively zero in all four years for Track 2 non-SSP practices ($p = 0.02$ for the difference between SSP subgroups across all four years).

CPC+ increased expenditures on:

- **Hospice.** Hospice expenditures increased by about 7 percent more for CPC+ Track 2 than for comparison practices, a pattern that first emerged in PY 2. Across the four program years, there was an average annual relative increase of $2.0 PBPM (7.3 percent, $p < 0.01$) in hospice expenditures. Consistent with this finding, we found that CPC+ Track 2 was associated with a greater likelihood of using hospice services and a greater increase in the average number of days in hospice. (See Section 5.2, Subsection C.3 for further discussion.) Estimated increases in hospice expenditures were similar by SSP status.
- **Ambulatory visits with primary care providers. CPC+ increased expenditures for ambulatory visits with primary care practitioners by 5 percent.** Consistent with the CPC+ model design, expenditures for ambulatory visits with primary care practitioners at *assigned* practices increased by $1.6 PBPM (10.4 percent, $p < 0.01$) more among Track 2 practices relative to comparison practices; conversely, these same expenditures at *non-assigned* practices decreased by $0.4 PBPM (3.9 percent, $p < 0.01$) more among Track 2 practices relative to comparison practices. Over the four program years combined, there was an estimated net increase of $1.2 PBPM (4.6 percent, $p < 0.01$) in overall expenditures (including base CPCPs but not the 10 percent comprehensiveness adjustment) for ambulatory visits with primary care practitioners. This increase first emerged in PY 2 and continued through PY 4, increasing from $1.0 PBPM (3.9 percent, $p < 0.01$) in PY 2 to $2.3 PBPM (9.5 percent, $p < 0.01$) in PY 4. Estimated increases in expenditures for ambulatory visits with primary care providers were similar by SSP status. Paradoxically, while the average annual expenditures for ambulatory primary care increased by 4.6 percent, Track 2 CPC+ practices

[31] The triple-difference estimate for outpatient ED visits expenditures was $0.4 with a confidence interval ranging from -$0.3 to $1.2 ($p = 0.34$).

experienced a 1 percent reduction in average annual ambulatory primary care visits relative to comparison practices (See Section 5.2, Subsection B). This discrepancy between expenditures and service use for ambulatory visits with primary care providers suggests that the CPCPs that Track 2 practices receive may not be cost-neutral (even after taking out the comprehensiveness adjustment). (See Section 5.A.2.B for further discussion.)

- **Inpatient rehabilitation facilities. Over the four program years, inpatient rehabilitation facility expenditures increased 6 percent more for Track 2 practices relative to comparison practices.** Similar to our findings for Track 1, there was a 6.3 percent relative increase in inpatient rehabilitation facility expenditures ($1.3 PBPM, $p < 0.01$) for Track 2 practices versus comparison practices. This effect was consistently observed across the four program years (with annual estimates ranging from $0.8 PBPM, $p = 0.06$ in PY 1 to $2.1 PBPM, $p < 0.01$ in PY 4). As in Track 1, the relative increase in inpatient rehabilitation facility expenditures was more pronounced among non-SSP practices ($1.7 PBPM, 8.0 percent, $p < 0.01$) versus SSP practices ($0.9 PBPM, 4.3 percent, $p = 0.14$), but for Track 2 differences by SSP status were not statistically significant ($p = 0.37$ for the difference by SSP subgroup).

There were no discernible effects on expenditures for skilled nursing facilities, durable medical equipment, or total expenditures for physician and nonphysician Part B noninstitutional services in any setting. Estimates in these expenditure categories were 2 percent or less, less than $1 PBPM, and not statistically significant. However, there was a relative increase in physician and nonphysician Part B noninstitutional services expenditures for non-SSP Track 2 practices of $3.3 PBPM (1.3 percent, $p = 0.01$). This trend emerged in PY 2 and grew from $2.8 PBPM (1.1 percent, $p = 0.04$) in PY 2 to $6.2 PBPM (2.4 percent, $p < 0.01$) in PY 4. There were no significant effects on physician and nonphysician Part B noninstitutional services expenditures for SSP Track 2 practices; however, the estimates were in the opposite direction in all four years and were significantly different from non-SSP practices ($p < 0.01$ for the difference by SSP subgroup).

A.3. Medicare expenditures, including CMS's enhanced payments (CMFs, PBIPs, SSP payments, comprehensiveness supplements, and QPP payments)

After adding all enhanced payments, we found that expenditures for Track 2 practices increased $24.3 PBPM or 2.6 percent ($p < 0.01$) relative to comparison practices in the first four program years. CMS's enhanced payments include payments for participation in CPC+ and for performance. We arrived at this estimate by going through the following steps to account for various payments:

- We first included payments for practices' participation in CPC+ (CMFs and the comprehensiveness supplement for practices in Track 2). We found that, over the first four program years, Medicare expenditures increased $24.3 PBPM or 2.6 percent ($p < 0.01$) more for Track 2 practices than for comparison practices, after accounting for these payments. Both SSP and non-SSP practices in Track 2 experienced increases in Medicare expenditures, including payments for participation. However, in line with estimates for expenditures without enhanced payments, the estimated effects were larger for non-SSP practices ($30.6 PBPM, 3.3 percent, $p < 0.01$) than for SSP practices ($18.0 PBPM, 1.9 percent, $p < 0.01$).

The difference between SSP and non-SSP practices was statistically significant ($p = 0.08$ for the difference by SSP subgroup).

- Next, we included payments for participation (as described above) *and* for performance. Payments for performance included: (1) PBIPs, which only CPC+ non-SSP practices received during the intervention years, and (2) SSP ACO shared savings payments, which were received by ACOs that CPC+ and comparison SSP practices belonged to during both the baseline and intervention years.
  - *Non-SSP practices*. After adding in the PBIPs (in addition to the CMFs) that non-SSP Track 2 practices received in the four intervention years, the relative increase in Medicare expenditures for the non-SSP group increased by $1.0 PBPM— from $30.6 PBPM (3.3 percent, $p < 0.01$) without PBIPs to $31.6 PBPM (3.4 percent, $p < 0.01$) with PBIPs.[32]
  - *SSP practices.* After adding in the share of SSP payments that we assigned to beneficiaries in Track 2 SSP and comparison SSP practices (in addition to the CMFs), the estimate for the SSP group decreased by $2.1 PBPM, from $18.0 PBPM (1.9 percent, $p < 0.01$) without PBIPs to $15.9 PBPM (1.6 percent, $p < 0.01$) with PBIPs.[33]
    - This decline in the impact estimate was driven mainly by a decrease relative to comparison practices in the average SSP payment assigned to CPC+ SSP beneficiaries from baseline through the intervention period. Specifically, during the baseline year and throughout the four-year intervention period, the average PBPM shared savings payments we assigned to CPC+ SSP beneficiaries remained unchanged at $5 PBPM; however, during the same period, that payment increased from $5 PBPM to $8 PBPM for comparison SSP beneficiaries.
    - It is unlikely that CPC+ Track 2 caused the differential change in SSP payments for Track 2 beneficiaries versus comparison beneficiaries in SSP practices. Although PBPM SSP payments assigned to CPC+ Track 2 SSP beneficiaries decreased when CPC+ began in 2017 (the average PBPM shared savings payment for Track 2 SSP beneficiaries decreased from $5 in 2016 to $2 in 2017), CPC+ Track 2 SSP beneficiaries represent a small percentage (7 percent in 2017) of the total beneficiaries in their SSP ACOs.

[32] The impact estimate of $31.6 PBPM for Track 2 practices in the non-SSP subgroup includes both PBIPs and shared savings payments. Over time, CPC+ practices may join or leave the SSP, resulting in a small subset of non-SSP practices receiving shared savings payments. From baseline through the intervention period, the change in PBIPs was $2.1 PBPM higher for Track 2 non-SSP practices than for comparison practices. However, the change in shared savings payments was $1.1 PBPM lower for Track 2 non-SSP practices than for comparison practices. As a result, the overall increase in the impact estimate was $1.0 PBPM.

[33] The impact estimate of $15.9 PBPM for Track 2 practices in the SSP subgroup includes both PBIPs and shared savings payments. Over time, CPC+ practices may join or leave the SSP, resulting in a small subset of SSP practices receiving PBIPs. From baseline through the intervention period, the change in PBIPs was $0.5 PBPM higher for CPC+ Track 2 SSP practices than for comparison practices. However, the change in shared savings payments was $2.6 PBPM lower for CPC+ Track 2 SSP practices than for comparison practices. As a result, the overall decrease in the impact estimate was $2.1 PBPM.

A.4. Results of sensitivity tests for impact estimates on Medicare expenditures without CMS' enhanced payments

As in Track 1, most sensitivity tests for Track 2 indicated similar results to the main model: changes in expenditures of less than 1 percent. We tested the sensitivity of the impact estimate for our primary outcome—Medicare expenditures without CMS's enhanced payments—to several varying modeling assumptions. Specifically, we varied (1) the length of the baseline period, (2) the composition of the analysis sample, (3) the model specification, (4) the set of control variables (by controlling for contemporaneous SSP participation), (5) the definition of counterfactual (using a triple differences approach), and (6) the measure definition; we also conducted COVID-19-specific checks. Similar to the estimated impact from the main analysis (0.1 percent, $p = 0.88$), most impact estimates from the sensitivity tests were close to zero (ranging from 0.1 to 0.5 percent) and not statistically significant. Tables 5.A.11 and 5.A.12 show the results from these tests together with the motivation behind each of them.

The effects of truncating high expenditures were mixed, with some evidence that CPC+ Track 2 led to increased expenditures.

- When we trimmed expenditures at the 98th percentile of the distribution or used the generalized linear model with log link, the estimates were close to zero.
- In contrast, when we used log expenditures as our dependent variable, there was a 5.7 percent ($p < 0.01$) relative increase in Medicare expenditures.
- However, we do not necessarily prefer specifications that trim high-cost expenditures or log expenditures over our main analysis. One effect of CPC+ could be to reduce the number of high-cost cases. Specifications that reduce the importance of such cases would fail to take this effect into account.

As in Track 1, we obtained similar results to our main model in Track 2 by using an alternate definition of the primary expenditure outcome, which excludes the QPP payment adjustments. The QPP adjustments averaged only $2.5 PBPM (PY 3) and $2.6 PBPM (PY 4) for CPC+ Track 2 practices and $1.6 PBPM (PY 3) and $2.0 PBPM (PY 4) for comparison practices. Because these adjustments were small, the estimates for expenditures without the QPP payments were very similar to the estimates for our primary expenditure outcome, which includes the QPP payments in both PY 3 and PY 4 (PY 4 estimates are shown in Table 5.A.12).

None of the tests we conducted to assess potential bias due to COVID-19 in PY 4 showed statistically different results from the main analysis. The results from the triple differences model and the difference-in-differences estimates that excluded claims during the peak period of COVID-19's impact on health care utilization (March through May 2020) were similar to the main difference-in-differences estimates, and they lead to the same conclusion: CPC+ Track 2 did not reduce Medicare total expenditures (Table 5.A.12).

Table 5.A.11. Estimates of the four-year impact of CPC+ on Medicare expenditures without CMS's enhanced payments for Track 2, from main analysis and sensitivity tests

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Main analysis (cumulative estimate across four years)	**Uses a difference-in-differences analysis with an ITT beneficiary sample, a one-year baseline period, controls for baseline beneficiary characteristics, COVID-19-related controls, and practice fixed effects**	**$0.6**	**0.1%**	**0.88**	**-$5.4**	**$6.5**
Altering length of baseline period						
Use two-year baseline period (instead of one year) [a]	Controls for outcome levels over longer pre-CPC+ period	$1.5	0.2%	0.62	-$3.6	$6.6
Altering the composition of the beneficiary sample						
Use sample of beneficiaries attributed during both the baseline and intervention periods as the analysis sample [b]	Helps to adjust for changes in sample composition between baseline and follow-up that may differ for the intervention and matched comparison groups	$2.8	0.3%	0.42	-$3.0	$8.7
Examine the impacts for the subset of beneficiaries attributed in the first quarter of the baseline period and the intervention period [c]	Removes any effects that may be due to changes in sample composition over time, for both baseline and intervention years	$4.4	0.5%	0.22	-$1.5	$10.3
Instead of following an ITT approach to defining the beneficiary sample (once attributed, beneficiaries stay in the sample for all subsequent years), allow beneficiaries to drop out of the sample if they no longer meet attribution requirements [d, e]	Assesses whether ITT tends to attenuate true effects by retaining beneficiaries in the intervention group who are no longer seen by CPC+ practices	$1.3	0.1%	0.71	-$4.6	$7.2

Table 5.A.11 *(continued)*

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Altering the modeling assumptions						
Use generalized linear model with log link	Handles skewed expenditure distribution	-$2.9	-0.3%	0.65	-$13.4	$7.7
Trim expenditures at 98th percentile	Reduces influence of beneficiaries with high outlier expenditures	-$3.1	-0.4%	0.28	-$7.7	$1.6
Use log expenditures [f]	Reduces influence of beneficiaries with high outlier expenditures	NA	5.7%***	0.00	5.1%	6.3%
Controlling for contemporaneous SSP participation						
Use a model that controls for contemporaneous (same year) SSP participation status	Controls for changes in SSP participation status among CPC+ and comparison practices over time	$0.7	0.1%	0.84	-$5.2	$6.6
Alternative definition of counterfactual						
Use a triple differences approach [g]	Controls for regional differences in trends among CPC+ and comparison practices	$2.6	0.3%	0.62	-$6.1	$11.3

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

[a] Sample size is 17 percent larger than the main analysis.

[b] Sample size is about 30 percent smaller than the main analysis.

[c] Sample size is about 28 percent smaller than the main analysis.

[d] Sample size is about 8 percent smaller than the main analysis.

[e] The percentage of beneficiaries that are no longer attributed to CPC+ or to comparison practices but are still included in the research sample due to the ITT approach grows over time; however, the yearly estimate from this sensitivity test was similar to the corresponding estimate from the main analysis in PY 4 (-$3.9 [$p$ = 0.47] and -$2.9 [$p$ = 0.57] respectively).

[f] We obtained only a percentage impact, not a dollar impact, from the model specification with log of expenditures as the outcome. The dollar magnitude of the impact in this model depends on the starting value; for example, a 5.7 percent impact for someone with expenditures equal to the CPC+ mean during the intervention period would be about $53.9.

Sample size is 235 percent larger than the main analysis (because the triple-differences model also includes non-participating practices in CPC+ regions and unselected practices in comparison regions).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CI = confidence interval; ITT = intent-to-treat; SSP = Medicare Shared Savings Program.

Table 5.A.12. Estimates of the PY 4 impact of CPC+ on Medicare expenditures without CMS's enhanced payments for Track 2, from main analysis and sensitivity tests

Test	Motivation	Impact estimate	Percentage impact	*p*-Value	90% CI lower bound	90% CI upper bound
Main analysis (PY 4 estimate)	**Uses a difference-in-differences analysis with an ITT beneficiary sample, a one-year baseline period, controls for baseline beneficiary characteristics, COVID-19-related controls, and practice fixed effects**	**-$2.9**	**-0.3%**	**0.57**	**-$11.3**	**$5.4**
Altering the definition of the outcome (PY 4 estimate)						
Use expenditures that exclude the QPP payments	Tests whether estimates are sensitive to an alternative definition of the outcome	-$3.6	-0.4%	0.48	-$11.9	$4.7
COVID-19 specific sensitivity tests (PY 4 estimate)						
Estimate obtained through a triple differences approach [a]	Controls for regional differences in trends due to COVID-19 among CPC+ and comparison practices	-$1.4	-0.1%	0.85	-$13.7	$10.9
Estimate for expenditure outcome constructed by dropping claims from March 2020 to May 2020 [b]	Tests for the sensitivity of the estimate to changes in expenditures during peak COVID-19 period	-$2.2	-0.2%	0.68	-$10.7	$6.4

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

[a] Sample size is 235 percent larger than the main analysis (because the triple-differences model also includes non-participating practices in CPC+ regions and unselected practices in comparison regions).

[b] Sample size is 0.01 percent smaller than the main analysis.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CI = confidence interval; ITT = intent-to-treat; PY = Program Year.

A.5. Impact estimates on Medicare expenditures without CMS's enhanced payments for practice and patient subgroups

A.5.1. Findings from practice subgroup analysis

Track 2 practices had differential effects on Medicare expenditures across some practice subgroups. We were able to reject the hypothesis that the estimated impact of CPC+ is the same across all practice subgroups at conventional levels of statistical significance ($p = 0.07$), implying that the estimates could be meaningfully different from each other.

The effect of CPC+ on expenditures across the four program years was more favorable for practices that had participated in a prior primary care transformation initiative compared to those that had not. The average annual impact estimate for practices that had not participated in prior primary care transformation initiatives (CPC, MAPCP, or had medical home recognition) showed an *increase* in expenditures of $11.9 PBPM (1.2 percent, $p = 0.08$) (Table 5.A.13). In comparison, there was no effect on expenditures (-$2.8 PBPM, -0.3 percent, $p = 0.50$) among practices with prior transformation experience ($p = 0.08$ for the test of differences between subgroups). However, these findings should be interpreted cautiously for three reasons:

- Although CPC+ practices with prior transformation had similar baseline characteristics as comparison practices without prior transformation, the percentage of Track 2 practices with prior transformation experiences was still considerably higher than the comparison practices (81 percent versus 75 percent).
- The finding emerged in PY 4, so it is possible that it could have been driven by COVID-19 pandemic related factors (instead of CPC+) that could have affected practice subgroups differentially.
- The findings were not robust across model specifications. Notably, the impact estimate for practices without prior transformation experience was not statistically significant, nor was it significantly different from the estimate for practices with prior transformation experience when we excluded the COVID-19-related control variables.

Impact estimates for expenditures across the four program years differed meaningfully between practices owned by a hospital or health system (which had no effects) and independent practices (which experienced a reduction in expenditures).

- There was no significant impact on expenditures over the first four program years for hospital- or system-owned practices ($6.7 PBPM, 0.7 percent, $p = 0.15$) (Table 5.A.13), but there was a significant decrease in expenditures for independent practices (-$9.4 PBPM, -1.0 percent, $p = 0.09$), and the subgroups estimates were statistically different ($p = 0.01$ for the test of difference between subgroups).
- The differential effects among independent and hospital-owned practices in Track 2 varied by practices' SSP participation status. Within the group of Track 2 SSP practices, impacts were similar for hospital- or system-owned and independent practices. In contrast, in the Track 2 non-SSP group, the difference in impact estimates by practice ownership was statistically significant. Within the non-SSP group, there was a $17.9 PBPM (1.9 percent, $p <$

0.01) increase for hospital- or system-owned practices, which was statistically significantly different ($p < 0.01$ for the test of difference between subgroups) from the estimate for independent practices (-$8.8 PBPM, -1.0 percent, $p = 0.22$).

Although we should interpret these subgroup findings with caution, the favorable reduction in expenditures for independent practices is consistent with findings on service use among these groups. In particular, the average annual impact estimate for independent practices suggested a relative decrease of 8 hospitalizations per 1,000 beneficiaries (-3 percent) for CPC+ versus comparison practices ($p < 0.01$), which is statistically significantly different from the effectively zero impact estimate for hospital- and system-owned practices.

Table 5.A.13. Estimates of the four-year impact of CPC+ on Medicare expenditures without CMS's enhanced payments, by baseline practice characteristics for Track 2

Practice subgroup definition, based on baseline characteristics	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	Percentage impact	*p*-Value for difference in impact estimates between subgroups[a]
Main analysis (all practices)	-	**$0.6 ($3.6)**	**0.1%**	-
Whether practice participated in prior primary care transformation initiatives (recognized as a medical home or participated in MAPCP or CPC Classic)				
Yes	865,968 (81.2%)	-$2.8 ($4.2)	-0.3%	
No	201,077 (18.8%)	$11.9* ($6.8)	1.2%	0.08
Large and medium versus small practice based on number of primary care practitioners				
Large (6+ primary care practitioners)	589,329 (55.2%)	-$5.2 ($5.1)	-0.5%	
Medium (3–5 primary care practitioners)	340,484 (31.9%)	$6.7 ($6.1)	0.7%	
Small (1–2 primary care practitioners)	137,233 (12.9%)	$5.4 ($8.9)	0.6%	0.40
Whether hospital- or system-owned versus independent				
Hospital- or system-owned	620,038 (58.1%)	$6.7 ($4.7)	0.7%	
Independent	447,007 (41.9%)	-$9.4* ($5.6)	-1.0%	0.01
For SSP practices				
Hospital-or system owned	289,387 (61.3%)	-$5.0 ($6.8)	-0.5%	
Independent	182,316 (38.7%)	-$7.7 ($8.9)	-0.8%	0.62
For non-SSP practices				
Hospital-or system owned	330,770 (55.6%)	$17.9*** ($6.2)	1.9%	
Independent	264,572 (44.4%)	-$8.8 ($7.1)	-1.0%	0.00
Practice type: multi-specialty versus primary care only				
Multi-specialty	278,854 (26.1%)	-$3.1 ($8.5)	-0.3%	
Primary care only	788,191 (73.9%)	$1.0 ($3.9)	0.1%	0.95
Urbanicity of practice's county: rural or suburban location versus urban location				
Rural	82,639 (7.7%)	$5.4 ($10.8)	0.6%	
Suburban	170,348 (16.0%)	$2.7 ($10.6)	0.3%	
Urban	814,057 (76.3%)	-$1.2 ($4.0)	-0.1%	0.67

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Table 5.A.13 *(continued)*

Note: The estimates (and standard errors) in the impact estimate column show the separate subgroup-specific impacts over the first four years of CPC+ for each practice characteristic listed in the table. We only tested differences within each subgroup if the estimates were significantly different between the two subgroups (that is, the p-value in the last column was <.10). Asterisks denote whether the impact estimate within a subgroup was significantly different from zero when estimates were significantly different between the subgroup categories.

[a] The *p*-values in the last column represent the results from tests for statistically significant differences in impact estimates between the subgroups based on the baseline practice characteristic (using a t-test for subgroups with two categories and an F-test for subgroups with more than two categories).

*/**/***Within-subgroup estimate significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CPC = Comprehensive Primary Care; MAPCP = Multi-payer Advanced Primary Care Practice; SSP = Medicare Shared Savings Program.

A.5.2. Findings from beneficiary subgroup analysis

Track 2 impact estimates for Medicare expenditures without CMS's enhanced payments did not differ by beneficiaries' baseline characteristics. As in Track 1, regardless of the definition of high risk, there were no statistically significant differences between the high-risk and non-high-risk beneficiary subgroups (Table 5.A.14). Note that most of the sample falls into the subgroup that is not high-risk; thus, that subgroup has more statistical power than the high-risk subgroup.

Table 5.A.14. Estimates of the four-year impacts of CPC+ on Medicare expenditures without CMS's enhanced payments, by baseline beneficiary characteristics for Track 2

Beneficiary subgroup definition, based on baseline characteristics	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	Percentage impact	*p*-Value for difference in impact estimates between subgroups[a]
Main analysis (all beneficiaries)	-	**$0.6 ($3.6)**	0.1%	-
Patients in the highest quartile of the HCC score distribution				
Yes	268,498 (26.1)	$5.9 ($10.1)	0.3%	
No	762,176 (73.9)	$4.0 ($2.9)	0.6%	0.85
Patients in the highest decile of the HCC score distribution or who have dementia				
Yes	162,578 (15.8)	$9.3 ($14.1)	0.4%	
No	868,097 (84.2)	$3.4 ($3.1)	0.4%	0.68
Patients with selected behavioral health conditions (schizophrenia, depression or bipolar disorders, or drug or alcohol psychosis or dependence)				
Yes	97,057 (9.4)	$19.3 ($12.5)	1.4%	
No	933,618 (90.6)	$3.0 ($3.5)	0.3%	0.19
Patients with multiple chronic conditions (at least 2 of 12 frequently occurring chronic conditions[b]) and one or more hospitalizations[c]				
Yes	90,561 (8.8)	$24.4 ($19.3)	1.0%	
No	940,113 (91.2)	$2.9 ($3.3)	0.3%	0.27
Patients dually eligible for Medicare and Medicaid				
Yes	140,817 (12.5)	$3.5 ($10.5)	0.3%	

Table 5.A.14 ***(continued)***

Beneficiary subgroup definition, based on baseline characteristics	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	Percentage impact	*p*-Value for difference in impact estimates between subgroups[a]
No	984,942 (87.5)	$0.0 ($3.7)	0.0%	0.74

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: To determine subgroup membership, beneficiary characteristics are measured at the start of the year-long baseline period for baseline observations and at the start of PY 1 for observations in the intervention period (PY 1 through PY 4). The estimates (and standard errors) in the impact estimate column show the separate subgroup-specific impacts for each beneficiary characteristic listed in the table. We only tested differences *within* each subgroup if the estimates were significantly different *between* the two subgroups (the *p*-value in the last column was <.10). Asterisks denote whether the impact estimate *within* a subgroup was significantly different from zero when estimates were significantly different between subgroup categories. We could not observe diagnoses (which are used to determine HCCs and to calculate HCC scores) at baseline for beneficiaries who were new to Medicare during the program years; we therefore excluded new Medicare beneficiaries from all subgroup analyses (except the analysis based on dual status because beneficiaries who are new to Medicare cannot, by definition, be enrolled in both Medicare and Medicaid prior to joining Medicare). Due to this process, about 10 percent of the observations from the regressions were excluded for the subgroups defined by HCC scores and chronic conditions. Therefore, the overall main impact estimate for Track 2 of $0.6 PBPM may not lie between the impact estimates for these subgroups.

[a] The *p*-values in the last column represent results from tests for statistically significant differences in impact estimates between the subgroups based on the baseline beneficiary characteristic (using a t-test for all subgroups).

[b] The 12 frequently occurring chronic conditions are: (1) congestive heart failure, (2) chronic obstructive pulmonary disease, (3) history of acute myocardial infarction, (4) ischemic heart disease, (5) diabetes, (6) metastatic cancer or acute leukemia, (7) history of stroke, (8) depression, (9) dementia, (10) atrial fibrillation, (11) rheumatoid arthritis or osteoarthritis, and (12) chronic kidney disease.

[c] For observations in the baseline year, hospitalizations were measured in 2015, the year before the start of the baseline year. For observations in the intervention period, hospitalizations were measured in 2016, the year before the start of PY 1.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

HCC = hierarchical condition category.

B. Medicare FFS service use

Acute hospitalizations. Over the first four program years, CPC+ reduced acute hospitalizations for Track 2 practices relative to comparison practices. Acute hospitalizations decreased for both CPC+ Track 2 and comparison practices during the first four program years compared to the year before CPC+ began. The reduction was larger for Track 2 practices than for comparison practices, leading to an average annual relative reduction of 3 hospitalizations per 1,000 beneficiaries (-1.1 percent, $p = 0.04$). These effects emerged in PY 3 and continued through PY 4, with relative reductions of 5 hospitalizations per 1,000 beneficiaries in both PY 3 (-1.7 percent, $p < 0.01$) and PY 4 (-1.9 percent, $p = 0.02$). Estimated reductions in acute hospitalizations were concentrated among Track 2 non-SSP practices (-4 hospitalizations per 1,000 beneficiaries, -1.6 percent, $p = 0.03$), but the differences by SSP status were not statistically significant ($p = 0.38$ for the difference by SSP subgroup). These reductions in acute hospitalizations are consistent with reductions in acute inpatient expenditures; however, changes in acute inpatient expenditures did not align well with the changes in acute hospitalizations by subgroup: there were larger reductions in acute inpatient expenditures among Track 2 SSP practices (see Section A.2 for more details).

ED visits. Similar to Track 1 results, CPC+ reduced total and outpatient-specific ED visits for Track 2 practices relative to comparison practices over the first four program years. Annualized total ED visits (which include ED visits that lead to hospitalizations) decreased by 13 visits per 1,000 beneficiaries more (-1.9 percent, $p < 0.01$, Table 5.A.15) for CPC+ Track 2 practices relative to comparison practices.

Annualized outpatient ED visits decreased for both CPC+ Track 2 and comparison practices during the first four program years, but they dropped more for CPC+ Track 2 practices, leading to an average annual relative decrease of 8 visits per 1,000 beneficiaries (-1.7 percent, $p < 0.01$) (Table 5.A.15). Consistent with the theory of change for CPC+, the reductions emerged early, with reductions observed in the first program year. This reduction in outpatient ED visits aligns with the 1.3 percent average annual reduction in expenditures for outpatient ED visits described earlier, although statistically significant reductions in expenditures were not observed prior to PY 4 (Table 5.A.10).

Estimates across the four years for both total ED visits and outpatient ED visits were not significantly different by SSP status, except in PY 4 when estimated reductions were significantly larger for SSP practices ($p = 0.01$ for the difference by SSP subgroup), and there were significant reductions only for SSP practices (-19 visits per 1,000 beneficiaries, -5.1 percent, $p < 0.01$). However, the magnitude of the PY 4 estimates should be treated cautiously for the SSP group because the results differed substantially from the triple differences estimates (that is, the results were outside the triple difference 90 percent confidence interval), and no implementation evidence suggested that CPC+ practices' progress on care delivery requirements improved substantially after PY 3.

Almost all the reductions in outpatient ED visits were due to relative decreases in primary care substitutable and potentially primary care preventable outpatient ED visits. Track 2 practices experienced an average annual relative reduction of about 5 visits per 1,000 beneficiaries (-2.9 percent, $p < 0.01$) in primary care substitutable outpatient ED visits and of about 3 visits per 1,000 beneficiaries (-2.2 percent, $p < 0.01$) in potentially primary care preventable outpatient ED visits.[34]

Results from sensitivity tests (not shown) suggest that changes in impact estimates for outpatient ED visits in Track 2 in PY 4 should not necessarily be interpreted as increasingly favorable reductions. While the estimated reduction in outpatient ED visits in PY 4 appears to be larger than the corresponding estimates in PY 3 (Table 5.A.15), this should not necessarily be interpreted as an increasing trend for two reasons:

- The PY 4 estimate for outpatient ED visits was not statistically different from the PY 3 estimate at the 10 percent level of significance, suggesting that the larger estimates in PY 4 may be due to chance.

[34] The relative reductions of 5.1 primary care substitutable outpatient ED visits and 2.7 potentially primary care preventable outpatient ED visits accounted for 96 percent of the 8.1 visit reduction in all outpatient ED visits ([5.1 + 2.7] / 8.1 = 96 percent).

- Triple-differences models estimated smaller impacts for outpatient ED visits in PY 4, and the difference-in-differences estimate in PY 4 was larger than the highest reduction implied by the 90 percent confidence interval around the triple-differences estimate.

We found no evidence that differential health care avoidance during the initial months of the COVID-19 pandemic led to a bias in the PY 4 estimates for service use in Track 2. Results from a sensitivity test that dropped claims from the peak period of COVID-19's impact on health care utilization (March through May 2020) yielded impact estimates on both outpatient ED visits and hospitalizations in PY 4 that were similar in magnitude to our main analysis, suggesting that health care avoidance in the first three months of the pandemic did not bias impact estimates in PY 4.

Urgent care visits. Similar to the findings in Track 1, an effect on urgent care visits emerged for the first time among Track 2 practices in PY 4; however, this may have been driven partially by a response to the COVID-19 pandemic rather than by a CPC+ effect. In PY 4, Track 2 CPC+ practices experienced a relative increase in urgent care visits of 9 visits per 1,000 beneficiaries (7.4 percent, $p = 0.02$). However, there were no statistically significant impact estimates in other years; thus, the average annual estimate for urgent care visits over the four program years was not statistically significant (2.5 visits per 1,000 beneficiaries, $p = 0.37$). As for Track 1, the PY 4 findings on urgent care visits should be interpreted cautiously because the triple-differences estimate did not suggest impacts on urgent care visits in PY 4, and the difference-in-differences estimate was larger than the highest increase implied by the 90 percent confidence interval around the triple-differences estimate. Between PY 3 and PY 4, urgent care visit rates declined among comparison practices while remaining relatively stable for CPC+ practices; however, we observed the same relatively stable trend for practices in CPC+ regions that did not participate in CPC+. This suggests that COVID-19 shocks or other regional trends might explain the relative increases in urgent care visits in PY 4.

Ambulatory care visits. Relative to comparison practices, CPC+ was associated with reductions in ambulatory primary care visits among Track 2 practices. Average annual ambulatory primary care visits decreased more for Track 2 practices than for the comparison group by 44 visits per 1,000 beneficiaries (-1.0 percent, $p = 0.03$). Relative reductions in ambulatory primary care visits for CPC+ Track 2 practices in PY 1 and PY 2 drove the reductions in average annual visits; associations did not continue in PY 3 or PY 4. Among CPC+ Track 2 practices, we did not observe a decrease in *expenditures* for ambulatory primary care visits over the first four program years that would correspond to the reduced visits; instead, there was a small increase of $1 PBPM (4.6 percent, $p < 0.01$) in expenditures on ambulatory primary care visits relative to comparison practices. These expenditures included fixed capitation payments or CPCPs paid to Track 2 practices during the intervention period. The fact that expenditures on these visits increased despite a decrease in the number of visits suggests that capitation payments offset any reduction in expenditures that would have occurred due to a decrease in the number of visits.

During the first four program years, Track 2 practices overall did not have any discernible effects on the number of ambulatory visits with specialists, but Track 2 SSP practices did experience some reductions. In the SSP group, CPC+ Track 2 practices experienced an annualized relative decrease in ambulatory visits with specialists of, on average, 59 visits per

1,000 beneficiaries (-1.4 percent, $p < 0.01$) across all four years. Estimates for the non-SSP group were in the opposite direction and not statistically significant. The differences in estimates by SSP status were statistically significant ($p < 0.01$ for difference by SSP subgroup).

Telehealth visits. Beneficiaries in Track 2 CPC+ practices experienced a greater shift toward telehealth than beneficiaries in comparison practices in PY 4. Before the COVID-19 pandemic, less than 0.2 percent of ambulatory visits were not face-to-face. In PY 4, 17.0 percent of all ambulatory primary care visits for CPC+ practices were not face-to-face; for comparison practices, the regression-adjusted rate was 14.8 percent (a 2.2 percentage point difference, $p < 0.01$) (Table 5.A.16). Similarly, in PY 4, 11.9 percent of all specialist visits to CPC+ practices were not face-to-face, 0.8 percentage points higher than the corresponding regression-adjusted percentage for comparison practices ($p < 0.01$). Expenditures for non-face-to-face visits followed a pattern similar to that for non-face-to-face visits (Table 5.A.16). Estimated increases in telehealth visits and expenditures were larger for non-SSP practices, but differences by SSP status were not statistically significant. Although both Track 1 and Track 2 CPC+ practices experienced a greater shift toward non-face-to-face ambulatory physician visits in PY 4, the relative increases in non-face-to-face visits for Track 2 CPC+ practices were approximately double the magnitude of those in Track 1 CPC+ practices. This is consistent with the greater emphasis on the provision of non-billable services in CPC+ Track 2 relative to Track 1 which could have been instrumental in better preparing Track 2 practices for the switch to telehealth during the COVID-19 pandemic.

Table 5.A.15. Regression-adjusted means and estimated impact of CPC+ on selected Medicare service use outcomes for attributed Medicare FFS beneficiaries over the first four program years, Track 2

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
Service use (per 1,000 beneficiaries per year)																		
Acute hospitalizations (short-stay acute care and critical access hospitals)																		
Baseline	292	288	NA	NA	NA	NA	300	291	NA	NA	NA	NA	287	286	NA	NA	NA	NA
PY 1	292	289	-0.6 (1.6)	-0.2%	(-3.2, 2.1)	0.72	301	293	-0.4 (2.4)	-0.1%	(-4.3, 3.5)	0.87	285	285	-0.7 (2.2)	-0.2%	(-4.3, 2.9)	0.75
PY 2	289	286	-1.5 (1.7)	-0.5%	(-4.4, 1.3)	0.37	297	289	0.1 (2.6)	0.0%	(-4.1, 4.3)	0.96	282	284	-2.9 (2.3)	-1.0%	(-6.7, 1.0)	0.22
PY 3	286	287	-5.0*** (1.9)	-1.7%	(-8.1, -2.0)	0.01	296	290	-1.9 (2.8)	-0.6%	(-6.4, 2.6)	0.49	278	285	-7.5*** (2.5)	-2.6%	(-11.6, -3.4)	0.00
PY 4	244	245	-4.7** (1.9)	-1.9%	(-7.8, -1.5)	0.01	253	248	-3.6 (3.0)	-1.4%	(-8.6, 1.4)	0.24	238	242	-5.2** (2.4)	-2.1%	(-9.2, -1.3)	0.03
PY 1 through 4	277	276	-3.2** (1.5)	-1.1%	(-5.7, -0.7)	0.04	286	279	-1.6 (2.3)	-0.6%	(-5.4, 2.1)	0.47	270	273	-4.3** (2.0)	-1.6%	(-7.6, -1.0)	0.03
Total ED visits, including observation stays[d]																		
Baseline	710	705	NA	NA	NA	NA	705	692	NA	NA	NA	NA	715	715	NA	NA	NA	NA
PY 1	705	708	-8.0*** (3.0)	-1.1%	(-12.9, -3.1)	0.01	700	695	-7.8* (4.3)	-1.1%	(-14.8, -0.8)	0.07	709	717	-8.1* (4.1)	-1.1%	(-14.9, -1.2)	0.05
PY 2	702	706	-9.9*** (3.3)	-1.4%	(-15.4, -4.4)	0.00	695	691	-8.3* (4.7)	-1.2%	(-16.1, -0.6)	0.08	707	717	-11.2** (4.7)	-1.6%	(-18.9, -3.5)	0.02
PY 3	700	709	-15.1*** (3.9)	-2.1%	(-21.5, -8.6)	0.00	694	695	-12.9** (5.7)	-1.8%	(-22.2, -3.6)	0.02	704	721	-16.8*** (5.4)	-2.3%	(-25.7, -7.9)	0.00
PY 4	568	578	-15.7*** (4.2)	-2.7%	(-22.5, -8.8)	0.00	561	572	-23.7*** (6.2)	-4.1%	(-33.9, -13.6)	0.00	573	582	-8.3 (5.6)	-1.4%	(-17.6, 0.9)	0.14
PY 1 through 4	666	673	-12.6*** (3.1)	-1.9%	(-17.8, -7.5)	0.00	660	661	-13.6*** (4.5)	-2.0%	(-21.1, -6.2)	0.00	670	682	-11.6*** (4.3)	-1.7%	(-18.7, -4.4)	0.01
Outpatient ED visits, including observation stays																		
Baseline	492	492	NA	NA	NA	NA	479	475	NA	NA	NA	NA	502	506	NA	NA	NA	NA
PY 1	486	494	-7.6*** (2.4)	-1.5%	(-11.5, -3.8)	0.00	471	476	-9.2*** (3.4)	-1.9%	(-14.8, -3.5)	0.01	498	508	-6.4** (3.2)	-1.3%	(-11.7, -1.1)	0.05
PY 2	483	490	-6.5** (2.7)	-1.3%	(-10.9, -2.1)	0.02	468	472	-8.0** (3.8)	-1.7%	(-14.3, -1.8)	0.03	496	505	-5.3 (3.7)	-1.1%	(-11.4, 0.9)	0.16
PY 3	483	491	-7.9** (3.1)	-1.6%	(-13.0, -2.8)	0.01	469	472	-7.7* (4.4)	-1.6%	(-14.8, -0.5)	0.08	495	507	-8.0* (4.3)	-1.6%	(-15.2, -0.9)	0.06
PY 4	377	386	-9.6*** (3.5)	-2.5%	(-15.3, -3.8)	0.01	361	376	-19.3*** (5.1)	-5.1%	(-27.8, -10.9)	0.00	389	394	-1.3 (4.7)	-0.3%	(-9.1, 6.5)	0.79
PY 1 through 4	455	463	-8.1*** (2.5)	-1.7%	(-12.2, -3.9)	0.00	440	447	-11.1*** (3.6)	-2.5%	(-17.1, -5.2)	0.00	467	476	-5.5 (3.5)	-1.2%	(-11.2, 0.3)	0.12
Primary care substitutable outpatient ED visits[e]																		
Baseline	191	192	NA	NA	NA	NA	186	185	NA	NA	NA	NA	195	197	NA	NA	NA	NA

Table 5.A.15 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
PY 1	187	192	-4.1*** (1.2)	-2.1%	(-6.0, -2.2)	0.00	181	185	-5.6*** (1.7)	-3.0%	(-8.4, -2.8)	0.00	192	197	-2.9* (1.6)	-1.5%	(-5.5, -0.3)	0.07
PY 2	183	188	-4.3*** (1.3)	-2.3%	(-6.3, -2.2)	0.00	177	181	-6.0*** (1.8)	-3.3%	(-9.0, -2.9)	0.00	189	194	-2.9* (1.7)	-1.5%	(-5.7, -0.1)	0.09
PY 3	181	187	-5.8*** (1.5)	-3.1%	(-8.3, -3.4)	0.00	174	179	-6.8*** (2.1)	-3.8%	(-10.3, -3.4)	0.00	186	194	-5.0** (2.0)	-2.6%	(-8.4, -1.7)	0.01
PY 4	134	140	-6.1*** (1.6)	-4.4%	(-8.8, -3.4)	0.00	127	136	-10.7*** (2.4)	-7.7%	(-14.6, -6.7)	0.00	139	144	-2.6 (2.2)	-1.9%	(-6.3, 1.0)	0.23
PY 1 through 4	170	176	-5.1*** (1.2)	-2.9%	(-7.1, -3.1)	0.00	163	169	-7.2*** (1.7)	-4.2%	(-10.1, -4.4)	0.00	175	181	-3.4** (1.6)	-1.9%	(-6.1, -0.7)	0.04
Potentially primary care preventable outpatient ED visits[e]																		
Baseline	133	131	NA	NA	NA	NA	127	125	NA	NA	NA	NA	137	136	NA	NA	NA	NA
PY 1	130	131	-2.5*** (0.8)	-1.9%	(-3.8, -1.1)	0.00	124	125	-2.9** (1.1)	-2.3%	(-4.8, -1.1)	0.01	134	135	-2.1* (1.1)	-1.5%	(-3.9, -0.2)	0.06
PY 2	128	128	-2.3** (0.9)	-1.7%	(-3.8, -0.7)	0.02	122	122	-2.9** (1.3)	-2.3%	(-5.0, -0.8)	0.02	132	133	-1.8 (1.3)	-1.3%	(-4.0, 0.4)	0.19
PY 3	127	128	-2.8*** (1.0)	-2.2%	(-4.4, -1.2)	0.00	121	123	-3.5** (1.4)	-2.8%	(-5.8, -1.3)	0.01	132	133	-2.3 (1.4)	-1.7%	(-4.5, 0.0)	0.10
PY 4	97	98	-2.9*** (1.0)	-2.9%	(-4.6, -1.2)	0.01	91	96	-6.5*** (1.5)	-6.6%	(-9.0, -4.0)	0.00	101	100	0.1 (1.4)	0.1%	(-2.2, 2.5)	0.92
PY 1 through 4	120	121	-2.7*** (0.8)	-2.2%	(-4.0, -1.4)	0.00	114	116	-4.0*** (1.1)	-3.4%	(-5.9, -2.2)	0.00	124	125	-1.6 (1.1)	-1.3%	(-3.4, 0.3)	0.16
Total Urgent Care Center (UCC) visits																		
Baseline	97	106	NA	NA	NA	NA	99	104	NA	NA	NA	NA	96	107	NA	NA	NA	NA
PY 1	111	119	1.0 (2.1)	0.9%	(-2.5, 4.4)	0.64	115	117	3.6 (3.8)	3.2%	(-2.6, 9.8)	0.34	108	121	-1.1 (2.2)	-1.0%	(-4.7, 2.6)	0.64
PY 2	124	131	2.0 (2.9)	1.6%	(-2.9, 6.8)	0.50	132	128	8.0* (4.6)	6.5%	(0.5, 15.6)	0.08	118	132	-2.9 (3.8)	-2.4%	(-9.1, 3.3)	0.44
PY 3	134	145	-2.5 (3.6)	-1.8%	(-8.5, 3.4)	0.49	138	144	-0.6 (6.1)	-0.4%	(-10.7, 9.5)	0.92	131	146	-4.0 (4.3)	-3.0%	(-11.1, 3.1)	0.36
PY 4	132	131	9.1** (3.8)	7.4%	(2.8, 15.3)	0.02	137	131	10.2* (6.1)	8.1%	(0.2, 20.1)	0.09	128	132	7.9* (4.7)	6.5%	(0.1, 15.7)	0.10
PY 1 through 4	126	132	2.5 (2.8)	2.0%	(-2.1, 7.0)	0.37	131	131	5.3 (4.5)	4.2%	(-2.2, 12.7)	0.25	122	133	0.1 (3.4)	0.1%	(-5.4, 5.6)	0.97
Primary care substitutable UCC visits																		
Baseline	58	62	NA	NA	NA	NA	59	62	NA	NA	NA	NA	57	63	NA	NA	NA	NA
PY 1	67	71	0.4 (1.3)	0.7%	(-1.6, 2.5)	0.73	69	70	2.5 (2.3)	3.7%	(-1.3, 6.3)	0.28	65	71	-1.2 (1.4)	-1.8%	(-3.4, 1.1)	0.39
PY 2	74	78	0.7 (1.7)	0.9%	(-2.2, 3.5)	0.70	79	77	4.6* (2.7)	6.3%	(0.3, 9.0)	0.08	70	78	-2.5 (2.2)	-3.5%	(-6.2, 1.2)	0.26
PY 3	81	86	-0.8 (2.1)	-1.0%	(-4.4, 2.7)	0.69	84	85	1.2 (3.7)	1.5%	(-4.8, 7.3)	0.74	78	86	-2.5 (2.5)	-3.1%	(-6.6, 1.7)	0.33

Table 5.A.15 *(continued)*

	Track 2—Overall						Track 2—SSP						Track 2—Non-SSP					
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	p-Value
PY 4	85	83	6.6*** (2.4)	8.3%	(2.7, 10.5)	0.01	90	84	8.0** (3.7)	9.8%	(1.8, 14.1)	0.03	82	82	5.1* (3.0)	6.6%	(0.2, 10.0)	0.09
PY 1 through 4	77	80	1.8 (1.6)	2.4%	(-0.9, 4.5)	0.27	81	80	4.2 (2.7)	5.4%	(-0.3, 8.6)	0.13	74	80	-0.1 (2.0)	-0.2%	(-3.4, 3.1)	0.94
Ambulatory primary care visits (including to FQHCs, RHCs, and CAHs)[f]																		
Baseline	4,361	4,438	NA	NA	NA	NA	4,214	4,355	NA	NA	NA	NA	4,476	4,503	NA	NA	NA	NA
PY 1	4,364	4,512	-71.0*** (16.3)	-1.6%	(-97.8, -44.2)	0.00	4,237	4,425	-47.2** (20.9)	-1.1%	(-81.6, -12.9)	0.02	4,466	4,583	-90.0*** (24.0)	-2.0%	(-129.5, -50.6)	0.00
PY 2	4,393	4,515	-45.2** (21.4)	-1.0%	(-80.4, -10.0)	0.03	4,268	4,436	-27.4 (28.6)	-0.6%	(-74.5, 19.7)	0.34	4,494	4,580	-59.2* (30.8)	-1.3%	(-109.9, -8.6)	0.05
PY 3	4,449	4,564	-37.9 (25.8)	-0.8%	(-80.4, 4.6)	0.14	4,332	4,492	-18.5 (38.1)	-0.4%	(-81.2, 44.1)	0.63	4,543	4,623	-53.4 (35.0)	-1.2%	(-110.9, 4.1)	0.13
PY 4	3,991	4,094	-26.2 (27.4)	-0.7%	(-71.3, 19.0)	0.34	3,882	4,021	1.9 (38.5)	0.0%	(-61.5, 65.2)	0.96	4,078	4,147	-41.2 (36.7)	-1.0%	(-101.5, 19.2)	0.26
PY 1 through 4	4,293	4,414	-44.2** (20.4)	-1.0%	(-77.7, -10.7)	0.03	4,174	4,336	-21.0 (28.3)	-0.5%	(-67.6, 25.6)	0.46	4,388	4,476	-60.8** (28.5)	-1.4%	(-107.7, -14.0)	0.03
Ambulatory specialty care visits (including to FQHCs, RHCs, and CAHs)[f]																		
Baseline	4,425	4,322	NA	NA	NA	NA	4,638	4,511	NA	NA	NA	NA	4,258	4,172	NA	NA	NA	NA
PY 1	4,380	4,279	-2.4 (10.3)	-0.1%	(-19.3, 14.5)	0.81	4,564	4,456	-18.6 (17.3)	-0.4%	(-47.1, 9.8)	0.28	4,233	4,137	10.4 (12.2)	0.2%	(-9.8, 30.5)	0.40
PY 2	4,362	4,272	-12.4 (14.4)	-0.3%	(-36.1, 11.3)	0.39	4,534	4,461	-53.2** (23.8)	-1.2%	(-92.3, -14.1)	0.03	4,224	4,117	20.1 (17.2)	0.5%	(-8.2, 48.5)	0.24
PY 3	4,271	4,187	-19.5 (16.5)	-0.5%	(-46.6, 7.7)	0.24	4,436	4,378	-68.9*** (25.9)	-1.5%	(-111.5, -26.3)	0.01	4,139	4,033	19.7 (20.9)	0.5%	(-14.7, 54.1)	0.35
PY 4	3,677	3,601	-26.7 (18.5)	-0.7%	(-57.1, 3.6)	0.15	3,803	3,763	-87.1*** (28.1)	-2.2%	(-133.4, -40.8)	0.00	3,577	3,462	28.6 (23.8)	0.8%	(-10.5, 67.8)	0.23
PY 1 through 4	4,157	4,071	-16.8 (13.2)	-0.4%	(-38.6, 5.0)	0.20	4,318	4,251	-59.3*** (21.0)	-1.4%	(-93.8, -24.8)	0.00	4,029	3,924	18.8 (16.5)	0.5%	(-8.3, 46.0)	0.25
Unweighted sample sizes for measures per 1,000 beneficiaries per year[g]																		
Number of practices	1,515	3,783					636	1,817					879	1,966				
Number of beneficiaries	1,762,047	4,173,931					788,310	2,088,824					977,592	2,096,364				
Number of beneficiary-years	5,920,967	13,908,971					2,626,614	6,959,723					3,294,353	6,949,248				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

Table 5.A.15 ***(continued)***

[a] We report the actual, unadjusted averages in the baseline period that are similar for the CPC+ and comparison groups due to matching. In the intervention period, the comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices and controlling for beneficiary characteristics and practice fixed-effects.

[c] We calculated percentage impacts relative to what the CPC+ mean would have been in PY1 through PY 4 (separately and combined) in the absence of the intervention (that is, the unadjusted CPC+ mean minus the impact estimate).

[d] Total ED visits include ED or observation stays that led to a hospitalization, including a psychiatric hospitalization.

[e] The sum of primary care substitutable outpatient ED visits and potentially primary care preventable outpatient ED visits is less than total outpatient ED visits because total outpatient ED visits includes those for other care needs, such as injuries, mental health, drugs, and alcohol.

[f] Ambulatory visits with primary care practitioners and specialists include office-based visits and home visits, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

[g] After accounting for weights that adjust for matching and time observed in Medicare FFS, the effective sample sizes decrease but are still substantial. For the comparison group, the effective sample size is 38 to 43 percent the size of the actual sample size. For the CPC+ group, the effective sample size is about 96 percent of the actual sample size because it is affected only by time observed (and not by matching weights).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; CAH = Critical Access Hospital; ED = emergency department; FFS = fee-for-service; FQHC = Federally Qualified Health Center; NA = not applicable; pp = percentage points; PY = Program Year; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.A.16. Regression-adjusted means and estimated impact of CPC+ on telehealth outcomes (non-face-to-face ambulatory visits and associated expenditures) for attributed Medicare FFS beneficiaries in PY 4,Track 2

	Track 2 – Overall					Track 2 – SSP					Track 2 – Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value
Primary care visits															
Proportion of ambulatory primary care visits that are non-face-to- face[c,d]	17.0%	14.8%	2.2*** (0.3)	(1.6, 2.7)	0.00	17.8%	16.1%	1.7*** (0.6)	(0.8, 2.6)	0.00	16.3%	14.3%	2.0*** (0.4)	(1.3, 2.6)	0.00
Proportion of expenditures on ambulatory primary care visits that are non-face-to-face[c,d]	15.1%	13.6%	1.5*** (0.4)	(0.9, 2.1)	0.00	15.6%	14.8%	0.8 (0.6)	(-0.2, 1.8)	0.12	14.7%	13.3%	1.4*** (0.4)	(0.7, 2.1)	0.00
Specialist care visits															
Proportion of ambulatory specialist visits that are non-face-to-face[c,d]	11.9%	11.2%	0.8*** (0.1)	(0.5, 1.0)	0.00	12.4%	12.0%	0.4* (0.2)	(0.0, 0.8)	0.08	11.6%	10.8%	0.8*** (0.2)	(0.5, 1.1)	0.00
Proportion of expenditures on ambulatory specialist visits that are non-face-to-face[c,d]	11.8%	11.0%	0.8*** (0.2)	(0.5, 1.0)	0.00	12.2%	11.8%	0.4* (0.2)	(0.0, 0.8)	0.08	11.5%	10.8%	0.8*** (0.2)	(0.5, 1.1)	0.00
Unweighted sample sizes for non-face-to-face primary care visits proportion measure															
Number of practices Number of beneficiaries	1,515 1,133,044	3,783 2,728,289				636 500,445	1,817 1,364,411				879 632,599	1,966 1,363,878			
Unweighted sample sizes for non-face-to-face primary care expenditures proportion measure															
Number of practices Number of beneficiaries	1,515 1,069,446	3,783 2,574,185				636 473,176	1,817 1,291,546				879 596,270	1,966 1,282,639			
Unweighted sample sizes for non-face-to-face specialist care visits proportion measure															
Number of practices Number of beneficiaries	1,515 946,221	3,783 2,286,322				636 426,281	1,817 1,159,553				879 519,940	1,966 1,126,769			

Table 5.A.16 *(continued)*

	Track 2 – Overall					Track 2 – SSP					Track 2 – Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value
Unweighted sample sizes for non-face-to-face specialist care expenditures proportion measure															
Number of practices	1,515	3,783				636	1,817				879	1,966			
Number of beneficiaries	885,146	2,141,580				398,961	1,088,376				486,185	1,053,204			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] The comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in PY 4 from the CPC+ mean in PY 4.

[b] Because non-face-to-face visits were close to zero in the baseline period (and the first three intervention years) for both CPC+ and comparison practices, we use a straight differences model for the non-face-to-face visits and expenditures outcomes. The estimate reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in PY 4 and the average outcome for Medicare FFS beneficiaries attributed to comparison practices in the same time period while controlling for beneficiary characteristics and (selected) outcomes at baseline.

[c] Ambulatory visits are identified as face-to-face or non-face-to-face based on procedure codes, telehealth modifiers, and place of service (carrier file only) listed on Medicare claims. Visits such as telephone or online assessment and management and E&M are included in the non-face-to-face measure, making it broader than CMS's definition of "telehealth" visits.

[d] Measures include only beneficiaries with non-zero counts of visits or expenditures. Sample sizes for each measure are shown in the table.

C. Claims-based quality of care

C.1. Planned care and population health measures

Similar to our findings for Track 1, Track 2 practices had greater increases, relative to comparison practices, in the percentage of beneficiaries with diabetes receiving recommended services over the first four program years. The estimated impacts were less than one percentage point (Table 5.A.17), indicating that CPC+ led to modest improvements in quality of care for diabetes. Specifically, from baseline to the end of PY 4, among patients with diabetes attributed to Track 2 practices versus their comparison group counterparts:

- The likelihood of receiving HbA1c testing increased by 0.3 percentage points ($p = 0.09$).
- The likelihood of receiving an eye exam increased by one percentage point ($p < 0.01$).
- The likelihood of receiving attention for nephropathy was similar for the two groups ($p = 0.36$).
- The likelihood of receiving all three recommended tests increased by one percentage point ($p < 0.01$).
- The likelihood of receiving none of the three recommended tests decreased by 0.1 percentage points ($p = 0.10$).

Similar to our Track 1 findings, these estimates translate into small increases in the number of beneficiaries receiving these services. For example, these estimates imply that, per practice, an average of 1.1 additional beneficiaries with diabetes received an eye exam, and 1.1 additional beneficiaries with diabetes received all three tests.

Improvements in two of the five measures cited above occurred mainly for non-SSP practices, although estimates for both SSP and non-SSP groups were small (average annual estimates never exceeding 1.5 percentage points). Specifically, improvements among non-SSP practices regarding the likelihood of (1) receiving attention for nephropathy (0.7 percentage points, $p = 0.06$) and (2) not receiving any of the three recommended tests (-0.2 percentage points, $p = 0.01$) were significantly larger than the estimated impacts on these measures for SSP practices, where estimates were closer to zero ($p = 0.05$ and $p = 0.03$, respectively, for the test of significant difference by SSP status). Effects on the other diabetes measures were similar across SSP and non-SSP practices.

Among all Track 2 practices (SSP and non-SSP) at baseline, more than 92 percent of beneficiaries with diabetes received an HbA1c test, 65 percent received eye exams, more than 82 percent received attention for nephropathy, and 54 percent received all three tests, leaving limited room for improvement in HbA1c testing or attention for nephropathy. However, test rates (except for HbA1c testing) in the baseline period were slightly lower among non-SSP practices compared to SSP practices (generally by 1 to 4 percentage points). Thus, among non-SSP practices, there may have been greater room for improvement in these measures during the intervention period.

For Track 2 practices, CPC+ was associated with a less than one percentage point increase in breast cancer screening among female beneficiaries ages 52 through 74. About 74 percent of female beneficiaries ages 52 through 74 attributed to CPC+ Track 2 and comparison practices received breast cancer screenings at baseline. This rate increased slightly over the four program years for both CPC+ Track 2 and comparison practices, but it increased 0.8 percentage points ($p < 0.01$) more for Track 2 practices than for their comparison counterparts. The overall effect for Track 2 practices was driven by the 1.2 percentage point impact estimate ($p < 0.01$) for non-SSP Track 2 practices, which was significantly larger ($p < 0.01$ for the difference by SSP subgroup) than the 0.2 percentage point estimate among SSP Track 2 practices. The overall Track 2 impact estimate suggests an increase of 1.5 female beneficiaries ages 52 through 74 who received breast cancer screening per practice per year during the intervention period.

There was little evidence that CPC+ Track 2 improved appropriate medication use over the first four program years. Impact estimates for prescription drug related measures were less than half a percentage point, and, during the first four program years, there were no statistically significant differences between CPC+ Track 2 and comparison practices for the five prescription drug use measures (in the planned care and population health domain) we examined related to appropriate use of medication: (1) percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy; (2) percentage of beneficiaries on diabetes medications with >80 percent of days covered by medication; (3) percentage of beneficiaries on renin-angiotensin system antagonists with >80 percent of days covered by medication; (4) percentage of beneficiaries on statins with >80 percent of days covered by medication; and (5) percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy. However, among Track 2 SSP practices relative to their comparison practices, there were small decreases in the percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy (0.5 percentage points, $p < 0.01$) and those who were adherent to statins (0.3 percentage points, $p = 0.06$) during the first four program years. These decreases were significantly different from the even smaller changes for both of these measures among Track 2 non-SSP practices ($p < 0.01$ and $p = 0.05$, respectively, for the difference by SSP subgroup).

C.2. Measures for continuity of care

There was little evidence to suggest that continuity of care substantively improved among CPC+ Track 2 practices. We found a small average annual increase of 0.8 percentage points ($p = 0.03$) in the percentage of primary care ambulatory visits at the assigned practice (the practice the beneficiary was first attributed to during the baseline or intervention period). This finding suggests that during the intervention period, beneficiaries of Track 2 practices were slightly more likely than their comparison group counterparts to continue receiving their primary care services at the practice where they were initially attributed. Consistent with this finding, we also observed an average annual increase of $1.6 PBPM ($p < 0.01$) in expenditures on ambulatory visits with primary care practitioners at the assigned practice and a decrease of $0.4 PBPM ($p < 0.01$) in expenditures at the non-assigned practice among Track 2 practices (Table 5.A.10).

We did not observe improved continuity of care at the *practitioner* level; this is probably because CPC+ focused on team-based care. Specifically, when we treated individual practitioners in a

beneficiary's assigned primary care practice separately, there was a relative decrease of 0.2 percentage points ($p = 0.04$) in the percentage of visits with the usual provider of care and an increase of 0.1 ($p = 0.10$) in the Reversed Bice-Boxerman Index (ranging from 0 to 100) of fragmentation of care over the first four program years for CPC+ Track 2 beneficiaries versus comparison beneficiaries. When considering all practitioners at the assigned practice as a single practitioner, we found no effect on either measure of continuity of care among Track 2 practices over the first four program years.

C.3. Other quality of care measures

CPC+ Track 2 had no effect on unplanned readmissions or unplanned acute care use (including hospital readmissions, ED visits, and observation stays) following hospital or ED discharges. The difference-in-differences estimates for unplanned 30-day readmissions, unplanned acute care following an acute hospital discharge, and unplanned acute care following a discharge from an ED were essentially zero (Table 5.A.17). There were also no effects on the corresponding measures defined at the beneficiary level (instead of the discharge level).

Over the first four program years, CPC+ increased the use of hospice services for Track 2 practices relative to comparison practices. The four-year average annual impact estimate showed an increase of 0.1 percentage points in the proportion of beneficiaries with any use of hospice services in CPC+ Track 2 practices relative to the comparison practices ($p < 0.01$) (Table 5.A.17). Because only about 3 percent of beneficiaries attributed to Track 2 or comparison practices received hospice services during the baseline year, the impact estimate of 0.1 percentage points is small, but meaningful, signifying a 3.4 percent increase in use of hospice services (or an average of 0.8 additional beneficiaries receiving hospice services per practice per year). Among the beneficiaries who used any hospice services during the year, the average number of days in hospice increased by 2.5 more days (3.8 percent, $p < 0.01$) for CPC+ Track 2 practices relative to comparison practices. There was also an increase in the length of hospice stays when calculated among all beneficiaries (regardless of whether they were hospice users or not) of 0.1 days (7.6 percent, $p < 0.01$). Estimated effects on measures of hospice use were similar by SSP status.

CPC+ Track 2 practices had greater decreases in long-term opioid use and potential opioid overuse relative to comparison practices. The difference-in-differences estimates show that CPC+ Track 2 practices had larger decreases in long-term opioid use in PY 3 and PY 4 (both with 0.2 percentage points reductions, $p = 0.03$) than comparison practices. Across all four program years combined, the estimated reduction of 0.1 percentage points was statistically significant ($p = 0.08$). We also found a greater decrease in potential opioid overuse among Track 2 practices relative to comparison practices over the first four program years. Specifically, between baseline and the intervention period, the proportion of beneficiaries who were potentially overusing opioids decreased by 0.5 percentage points ($p = 0.09$) more among Track 2 practices than comparison practices. As with long-term opioid use, the average annual estimate for potential opioid overuse was driven by statistically significant reductions in PY 3 (-1.1 percentage points, $p < 0.01$) and PY 4 (-0.7 percentage points, $p = 0.08$). Estimated decreases in long-term opioid use and potential opioid overuse were similar by SSP status. There was limited evidence, however, that CPC+ Track 2 led to a reduction in the receipt of high-risk medication by Medicare beneficiaries, with the impact estimate being close to zero.

C.4 Mortality

CPC+ did not affect mortality. Similar to our Track 1 findings, there were no meaningful or statistically significant differences between beneficiaries attributed in the first quarter of the intervention to CPC+ Track 2 versus comparison practices with respect to the percentage of beneficiaries dying during the next 12 months (4 percent), 24 months (8 percent), 36 months (12 percent), or 48 months (17 percent) of the model (results not shown).

Table 5.A.17. Regression-adjusted means and estimated impact of CPC+ on selected claims-based quality-of-care measures for attributed Medicare FFS beneficiaries over the first four program years, Track 2

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	p-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	p-Value
Planned care and population health measures for beneficiaries ages 18–75 with diabetes (percentage)															
Received HbA1c test															
Baseline	92.5%	92.1%	NA	NA	NA	92.8%	92.0%	NA	NA	NA	92.2%	92.2%	NA	NA	NA
PY 1	92.9%	92.3%	0.3 (0.2)	(0.0, 0.6)	0.12	93.3%	92.4%	0.1 (0.2)	(-0.3, 0.5)	0.63	92.6%	92.2%	0.4 (0.3)	(0.0, 0.8)	0.13
PY 2	92.7%	92.1%	0.2 (0.2)	(-0.1, 0.5)	0.24	92.9%	92.1%	0.0 (0.3)	(-0.4, 0.4)	0.95	92.5%	92.1%	0.4 (0.3)	(-0.1, 0.8)	0.16
PY 3	92.7%	92.0%	0.4 (0.2)	(0.0, 0.7)	0.12	92.8%	91.9%	0.0 (0.4)	(-0.6, 0.7)	0.93	92.7%	92.1%	0.6** (0.3)	(0.2, 1.1)	0.02
PY 4	89.8%	89.2%	0.3 (0.2)	(-0.1, 0.7)	0.27	89.8%	89.0%	0.0 (0.4)	(-0.6, 0.7)	0.93	89.8%	89.4%	0.5 (0.3)	(0.0, 1.0)	0.13
PY 1 through 4	92.0%	91.3%	0.3* (0.2)	(0.0, 0.6)	0.09	92.2%	91.3%	0.1 (0.3)	(-0.3, 0.5)	0.75	91.9%	91.4%	0.5* (0.2)	(0.1, 0.9)	0.05
Received eye exam															
Baseline	65.4%	65.5%	NA	NA	NA	66.9%	66.9%	NA	NA	NA	64.2%	64.4%	NA	NA	NA
PY 1	66.1%	66.3%	0.0 (0.2)	(-0.4, 0.4)	0.86	66.9%	67.6%	-0.7 (0.4)	(-1.3, 0.0)	0.11	65.4%	65.3%	0.4 (0.3)	(0.0, 0.9)	0.13
PY 2	67.3%	66.3%	1.2*** (0.3)	(0.7, 1.7)	0.00	69.0%	67.6%	1.4*** (0.5)	(0.5, 2.2)	0.01	66.0%	65.2%	1.1*** (0.4)	(0.5, 1.7)	0.00
PY 3	68.0%	66.7%	1.5*** (0.3)	(0.9, 2.0)	0.00	70.1%	67.6%	2.6*** (0.6)	(1.6, 3.5)	0.00	66.3%	66.0%	0.6 (0.4)	(-0.1, 1.3)	0.13
PY 4	63.3%	62.3%	1.2*** (0.4)	(0.6, 1.8)	0.00	65.2%	63.0%	2.2*** (0.6)	(1.1, 3.2)	0.00	61.9%	61.7%	0.5 (0.4)	(-0.2, 1.2)	0.25
PY 1 through 4	66.1%	65.3%	1.0*** (0.3)	(0.5, 1.4)	0.00	67.8%	66.4%	1.4*** (0.5)	(0.6, 2.2)	0.00	64.9%	64.5%	0.7** (0.3)	(0.1, 1.2)	0.04
Received attention for nephropathy															
Baseline	82.7%	82.1%	NA	NA	NA	84.6%	82.8%	NA	NA	NA	81.1%	81.6%	NA	NA	NA
PY 1	83.4%	82.6%	0.3 (0.2)	(-0.1, 0.6)	0.27	85.2%	83.4%	0.0 (0.3)	(-0.5, 0.5)	0.98	81.9%	81.9%	0.5 (0.3)	(-0.1, 1.0)	0.15
PY 2	84.0%	82.7%	0.8*** (0.3)	(0.3, 1.2)	0.01	85.7%	83.6%	0.2 (0.4)	(-0.5, 0.8)	0.65	82.7%	81.9%	1.2*** (0.4)	(0.6, 1.9)	0.00
PY 3	83.8%	82.9%	0.4 (0.3)	(-0.1, 0.9)	0.22	85.0%	83.7%	-0.5 (0.4)	(-1.2, 0.2)	0.20	82.9%	82.3%	1.1** (0.4)	(0.4, 1.8)	0.01
PY 4	80.0%	80.0%	-0.6 (0.4)	(-1.2, 0.0)	0.10	81.4%	80.7%	-1.1** (0.5)	(-1.9, -0.2)	0.04	78.8%	79.5%	-0.2 (0.5)	(-1.0, 0.6)	0.66
PY 1 through 4	82.7%	82.0%	0.2 (0.3)	(-0.2, 0.7)	0.36	84.3%	82.8%	-0.3 (0.4)	(-0.9, 0.3)	0.36	81.6%	81.3%	0.7* (0.4)	(0.1, 1.3)	0.06

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Diabetes Composite Measure 1 (received all three tests above: HbA1c test, eye exam, attention for nephropathy)															
Baseline	54.0%	53.6%	NA	NA	NA	56.4%	55.2%	NA	NA	NA	52.1%	52.4%	NA	NA	NA
PY 1	55.1%	54.6%	0.1 (0.3)	(-0.3, 0.6)	0.62	57.0%	56.2%	-0.5 (0.5)	(-1.2, 0.3)	0.29	53.6%	53.3%	0.6* (0.4)	(0.0, 1.2)	0.08
PY 2	56.5%	54.5%	1.6*** (0.3)	(1.0, 2.1)	0.00	59.1%	56.2%	1.7*** (0.5)	(0.8, 2.7)	0.00	54.4%	53.3%	1.4*** (0.4)	(0.7, 2.2)	0.00
PY 3	56.7%	55.0%	1.4*** (0.4)	(0.7, 2.0)	0.00	59.4%	56.2%	2.0*** (0.6)	(1.0, 3.0)	0.00	54.7%	54.2%	0.8* (0.5)	(0.1, 1.6)	0.08
PY 4	50.5%	49.5%	0.7 (0.4)	(0.0, 1.4)	0.10	52.8%	50.3%	1.3* (0.7)	(0.2, 2.4)	0.06	48.9%	49.0%	0.2 (0.5)	(-0.6, 1.1)	0.68
PY 1 through 4	54.7%	53.3%	1.0*** (0.3)	(0.5, 1.5)	0.00	57.0%	54.6%	1.2** (0.5)	(0.4, 2.0)	0.01	52.8%	52.4%	0.8** (0.4)	(0.2, 1.5)	0.04
Diabetes Composite Measure 2 (received none of the three tests above)															
Baseline	2.1%	2.1%	NA	NA	NA	2.0%	2.2%	NA	NA	NA	2.2%	2.1%	NA	NA	NA
PY 1	1.9%	2.0%	-0.1 (0.1)	(-0.2, 0.1)	0.31	1.9%	2.0%	0.1 (0.1)	(-0.1, 0.2)	0.59	2.0%	2.1%	-0.2* (0.1)	(-0.4, 0.0)	0.09
PY 2	2.0%	2.1%	-0.2* (0.1)	(-0.3, 0.0)	0.06	1.9%	2.0%	0.0 (0.1)	(-0.2, 0.2)	0.73	2.0%	2.2%	-0.3*** (0.1)	(-0.5, -0.1)	0.01
PY 3	1.9%	2.2%	-0.2*** (0.1)	(-0.4, -0.1)	0.00	1.9%	2.1%	0.0 (0.1)	(-0.2, 0.1)	0.67	1.9%	2.2%	-0.4*** (0.1)	(-0.6, -0.2)	0.00
PY 4	3.3%	3.3%	0.0 (0.1)	(-0.1, 0.2)	0.75	3.2%	3.2%	0.2 (0.1)	(0.0, 0.4)	0.11	3.3%	3.3%	-0.1 (0.1)	(-0.3, 0.1)	0.50
PY 1 through 4	2.3%	2.4%	-0.1* (0.1)	(-0.2, 0.0)	0.10	2.2%	2.3%	0.1 (0.1)	(-0.1, 0.2)	0.57	2.3%	2.5%	-0.2** (0.1)	(-0.4, -0.1)	0.01
Unweighted sample sizes for the diabetes measures[c]															
Number of beneficiaries	295,184	689,613				129,358	340,960				166,280	349,887			
Number of beneficiary-years	799,554	1,852,906				347,481	915,963				452,073	936,943			
Planned care and population health measures for female beneficiaries ages 52–74 (percentage)															
Received breast cancer screening															
Baseline	73.6%	74.3%	NA	NA	NA	75.6%	75.0%	NA	NA	NA	72.0%	73.7%	NA	NA	NA
PY 1	74.7%	74.9%	0.5*** (0.1)	(0.2, 0.7)	0.00	76.5%	75.7%	0.2 (0.2)	(-0.1, 0.6)	0.30	73.2%	74.2%	0.6*** (0.2)	(0.3, 1.0)	0.00
PY 2	75.4%	75.2%	0.9*** (0.2)	(0.5, 1.2)	0.00	77.2%	76.3%	0.4 (0.3)	(-0.1, 0.8)	0.22	74.0%	74.4%	1.3*** (0.3)	(0.8, 1.7)	0.00
PY 3	76.0%	75.7%	1.0*** (0.2)	(0.6, 1.3)	0.00	77.5%	76.7%	0.2 (0.3)	(-0.4, 0.8)	0.55	74.8%	74.9%	1.5*** (0.3)	(1.1, 2.0)	0.00

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 4	73.9%	73.8%	0.8*** (0.2)	(0.4, 1.2)	0.00	75.0%	74.4%	0.0 (0.4)	(-0.6, 0.7)	0.94	73.0%	73.2%	1.4*** (0.3)	(0.9, 2.0)	0.00
PY 1 through 4	75.0%	74.9%	0.8*** (0.2)	(0.5, 1.1)	0.00	76.5%	75.7%	0.2 (0.3)	(-0.2, 0.7)	0.41	73.7%	74.2%	1.2*** (0.2)	(0.8, 1.6)	0.00
Unweighted sample sizes for the breast cancer screening measure[c]															
Number of beneficiaries	482,791	1,115,626				215,874	556,127				267,720	561,893			
Number of beneficiary-years	1,347,742	3,108,624				597,305	1,546,316				750,437	1,562,308			
Planned care and population health measures for beneficiaries ages 21 and older[d]															
Percentage of beneficiaries with cardiovascular disease who were prescribed and filled statin therapy															
Baseline	59.4%	59.7%	NA	NA	NA	60.0%	59.7%	NA	NA	NA	58.9%	59.6%	NA	NA	NA
PY 1	60.7%	60.9%	0.0 (0.1)	(-0.2, 0.2)	0.90	61.3%	61.2%	-0.2 (0.1)	(-0.4, 0.0)	0.18	60.1%	60.7%	0.2 (0.1)	(-0.1, 0.4)	0.22
PY 2	59.7%	60.1%	-0.1 (0.1)	(-0.3, 0.2)	0.62	60.2%	60.2%	-0.3 (0.2)	(-0.6, 0.0)	0.11	59.3%	59.9%	0.1 (0.2)	(-0.2, 0.4)	0.53
PY 3	60.9%	61.3%	-0.1 (0.2)	(-0.4, 0.1)	0.46	61.3%	61.6%	-0.7*** (0.2)	(-1.0, -0.3)	0.00	60.6%	61.0%	0.3 (0.2)	(0.0, 0.7)	0.14
PY 4	61.6%	62.1%	-0.2 (0.2)	(-0.5, 0.0)	0.15	61.9%	62.4%	-0.8*** (0.2)	(-1.2, -0.4)	0.00	61.2%	61.7%	0.2 (0.2)	(-0.2, 0.6)	0.32
PY 1 through 4	60.7%	61.1%	-0.1 (0.1)	(-0.3, 0.1)	0.38	61.2%	61.4%	-0.5*** (0.2)	(-0.8, -0.2)	0.00	60.3%	60.9%	0.2 (0.2)	(-0.1, 0.5)	0.24
Unweighted sample sizes for the statin therapy measure[c]															
Number of beneficiaries	904,747	2,136,567				414,134	1,090,552				492,123	1,050,421			
Number of beneficiary-years	2,704,845	6,357,594				1,231,407	3,253,633				1,473,438	3,103,961			
Planned care and population health measures for beneficiaries ages 18 and older[d]															
Percentage of beneficiaries on diabetes medications with proportion of days covered by medication > 80%															
Baseline	79.6%	79.9%	NA	NA	NA	80.5%	80.4%	NA	NA	NA	78.9%	79.6%	NA	NA	NA
PY 1	80.7%	80.8%	0.2 (0.2)	(-0.3, 0.6)	0.53	81.5%	81.0%	0.3 (0.4)	(-0.3, 0.9)	0.44	80.0%	80.7%	0.0 (0.3)	(-0.5, 0.6)	0.91
PY 2	81.7%	81.7%	0.3 (0.2)	(-0.1, 0.7)	0.16	82.4%	81.9%	0.4 (0.4)	(-0.3, 1.0)	0.34	81.2%	81.6%	0.3 (0.3)	(-0.2, 0.9)	0.32
PY 3	82.4%	82.7%	0.1 (0.2)	(-0.3, 0.5)	0.79	82.9%	83.0%	-0.3 (0.4)	(-0.9, 0.3)	0.40	82.1%	82.4%	0.4 (0.3)	(-0.2, 0.9)	0.27

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 4	84.5%	84.5%	0.4 (0.2)	(0.0, 0.8)	0.14	85.2%	84.7%	0.3 (0.4)	(-0.3, 0.9)	0.45	84.0%	84.3%	0.5 (0.3)	(-0.1, 1.0)	0.15
PY 1 through 4	82.4%	82.5%	0.2 (0.2)	(-0.1, 0.6)	0.28	83.1%	82.8%	0.1 (0.3)	(-0.4, 0.7)	0.69	81.9%	82.3%	0.3 (0.3)	(-0.1, 0.7)	0.26
Percentage of beneficiaries on renin-angiotensin system antagonists with proportion of days covered by medication > 80%															
Baseline	80.8%	81.0%	NA	NA	NA	81.3%	81.3%	NA	NA	NA	80.5%	80.7%	NA	NA	NA
PY 1	83.6%	83.7%	0.1 (0.1)	(-0.2, 0.3)	0.71	84.2%	84.2%	0.0 (0.2)	(-0.3, 0.3)	0.95	83.1%	83.2%	0.1 (0.2)	(-0.2, 0.4)	0.59
PY 2	84.3%	84.4%	0.1 (0.1)	(-0.2, 0.3)	0.59	84.8%	84.9%	-0.1 (0.2)	(-0.4, 0.2)	0.66	83.9%	84.0%	0.2 (0.2)	(-0.1, 0.5)	0.30
PY 3	84.0%	84.5%	-0.4** (0.1)	(-0.6, -0.1)	0.02	84.5%	85.0%	-0.5** (0.2)	(-0.8, -0.1)	0.02	83.5%	84.0%	-0.2 (0.2)	(-0.6, 0.1)	0.23
PY 4	86.2%	86.6%	-0.2 (0.1)	(-0.5, 0.0)	0.11	86.6%	87.0%	-0.4** (0.2)	(-0.7, -0.1)	0.05	85.8%	86.2%	-0.1 (0.2)	(-0.4, 0.3)	0.73
PY 1 through 4	84.6%	84.8%	-0.1 (0.1)	(-0.3, 0.1)	0.31	85.1%	85.3%	-0.3 (0.2)	(-0.5, 0.0)	0.14	84.2%	84.4%	0.0 (0.2)	(-0.3, 0.3)	0.96
Percentage of beneficiaries on statins with proportion of days covered by medication > 80%															
Baseline	78.8%	78.9%	NA	NA	NA	79.2%	79.3%	NA	NA	NA	78.5%	78.6%	NA	NA	NA
PY 1	78.9%	78.8%	0.2 (0.1)	(0.0, 0.4)	0.15	79.3%	79.4%	0.1 (0.2)	(-0.3, 0.4)	0.78	78.6%	78.3%	0.3* (0.2)	(0.0, 0.6)	0.09
PY 2	82.1%	82.2%	0.1 (0.1)	(-0.2, 0.3)	0.69	82.3%	82.7%	-0.3 (0.2)	(-0.6, 0.0)	0.12	82.0%	81.7%	0.3* (0.2)	(0.0, 0.6)	0.05
PY 3	82.8%	83.2%	-0.2* (0.1)	(-0.5, 0.0)	0.08	82.9%	83.6%	-0.5*** (0.2)	(-0.9, -0.2)	0.01	82.7%	82.8%	0.0 (0.2)	(-0.3, 0.3)	0.96
PY 4	85.3%	85.6%	-0.3* (0.1)	(-0.5, 0.0)	0.08	85.5%	86.0%	-0.4* (0.2)	(-0.7, -0.1)	0.05	85.1%	85.3%	-0.1 (0.2)	(-0.4, 0.2)	0.53
PY 1 through 4	82.5%	82.6%	-0.1 (0.1)	(-0.3, 0.1)	0.45	82.7%	83.1%	-0.3* (0.2)	(-0.6, 0.0)	0.06	82.3%	82.3%	0.1 (0.2)	(-0.1, 0.4)	0.44
Percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed and filled angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy															
Baseline	77.1%	76.8%	NA	NA	NA	77.4%	77.1%	NA	NA	NA	76.9%	76.6%	NA	NA	NA
PY 1	76.7%	76.7%	-0.2 (0.3)	(-0.7, 0.3)	0.52	77.0%	76.8%	0.0 (0.4)	(-0.7, 0.7)	0.95	76.5%	76.5%	-0.3 (0.4)	(-1.0, 0.3)	0.43
PY 2	75.8%	75.5%	0.0 (0.3)	(-0.5, 0.5)	0.97	75.9%	75.5%	0.2 (0.4)	(-0.5, 0.8)	0.71	75.7%	75.5%	-0.1 (0.4)	(-0.8, 0.6)	0.82
PY 3	75.5%	75.5%	-0.3 (0.3)	(-0.8, 0.3)	0.43	75.6%	75.5%	-0.2 (0.4)	(-0.9, 0.5)	0.70	75.4%	75.5%	-0.3 (0.5)	(-1.1, 0.5)	0.49
PY 4	73.8%	74.2%	-0.6* (0.3)	(-1.2, -0.1)	0.06	73.8%	74.3%	-0.8* (0.5)	(-1.6, 0.0)	0.09	73.8%	74.0%	-0.5 (0.5)	(-1.3, 0.3)	0.30
PY 1 through 4	75.4%	75.4%	-0.3 (0.3)	(-0.7, 0.2)	0.34	75.5%	75.5%	-0.2 (0.4)	(-0.8, 0.4)	0.61	75.3%	75.3%	-0.3 (0.4)	(-0.9, 0.3)	0.43

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Unweighted sample sizes for percentage of beneficiaries on diabetes medications with proportion of days covered by medication> 80%															
Number of beneficiaries	201,410	473,217				91,080	238,124				110,590	235,850			
Number of beneficiary-years	552,175	1,288,101				249,164	649,931				303,011	638,170			
Unweighted sample sizes for percentage of beneficiaries on renin-angiotensin system antagonists with proportion of days covered by medication > 80%															
Number of beneficiaries	617,922	1,457,195				279,070	735,152				339,732	724,670			
Number of beneficiary-years	1,738,675	4,073,187				782,714	2,058,227				955,961	2,014,960			
Unweighted sample sizes for percentage of beneficiaries on statins with proportion of days covered by medication > 80%															
Number of beneficiaries	706,645	1,685,625				324,717	862,221				383,000	826,712			
Number of beneficiary-years	2,079,593	4,938,343				953,006	2,533,026				1,126,587	2,405,317			
Unweighted sample sizes for percentage of beneficiaries with both CAD and diabetes who were prescribed and filled ACE inhibitor or ARB therapy															
Number of beneficiaries	161,447	368,899				73,026	187,776				88,585	181,588			
Number of beneficiary-years	341,508	766,150				153,210	391,861				188,298	374,289			
Measures for continuity of care[e]															
Percentage of primary care ambulatory visits at assigned practice															
Baseline	75.5%	73.3%	NA	NA	NA	74.7%	73.9%	NA	NA	NA	76.0%	72.8%	NA	NA	NA
PY 1	72.9%	70.4%	0.3 (0.2)	(-0.1, 0.7)	0.18	72.4%	71.1%	0.4 (0.4)	(-0.2, 1.0)	0.25	73.3%	69.8%	0.3 (0.3)	(-0.3, 0.8)	0.44
PY 2	64.7%	61.6%	1.0** (0.4)	(0.3, 1.7)	0.02	64.0%	62.1%	1.1 (0.7)	(0.0, 2.1)	0.11	65.3%	61.1%	0.9* (0.5)	(0.1, 1.8)	0.07
PY 3	62.7%	59.1%	1.4*** (0.5)	(0.6, 2.2)	0.00	62.0%	59.4%	1.7** (0.7)	(0.5, 2.9)	0.02	63.2%	58.8%	1.2* (0.6)	(0.1, 2.2)	0.07
PY 4	56.1%	53.4%	0.5 (0.7)	(-0.7, 1.7)	0.49	54.9%	53.5%	0.6 (1.1)	(-1.2, 2.4)	0.61	57.1%	53.2%	0.6 (1.0)	(-1.0, 2.2)	0.54
PY 1 through 4	63.7%	60.7%	0.8** (0.4)	(0.2, 1.5)	0.03	62.9%	61.1%	1.0 (0.6)	(0.0, 2.0)	0.10	64.3%	60.3%	0.8 (0.5)	(-0.1, 1.6)	0.13

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Across all PCPs and specialists providing care to a patient, where each practitioner in the beneficiary's assigned practice is treated separately															
Percentage of visits with the usual provider of care (UPC)															
Baseline	48.0%	47.9%	NA	NA	NA	46.9%	47.3%	NA	NA	NA	48.9%	48.4%	NA	NA	NA
PY 1	47.0%	47.0%	-0.1 (0.1)	(-0.2, 0.1)	0.48	46.0%	46.4%	0.0 (0.1)	(-0.2, 0.1)	0.76	47.8%	47.4%	-0.1 (0.1)	(-0.2, 0.1)	0.51
PY 2	46.0%	46.0%	-0.1 (0.1)	(-0.3, 0.0)	0.13	45.0%	45.5%	-0.1 (0.1)	(-0.3, 0.1)	0.33	46.8%	46.4%	-0.1 (0.1)	(-0.3, 0.1)	0.25
PY 3	45.2%	45.2%	-0.1 (0.1)	(-0.3, 0.0)	0.13	44.2%	44.7%	-0.1 (0.1)	(-0.3, 0.1)	0.58	46.0%	45.7%	-0.2 (0.1)	(-0.4, 0.0)	0.13
PY 4	47.8%	48.0%	-0.3*** (0.1)	(-0.5, -0.1)	0.01	46.9%	47.5%	-0.2 (0.2)	(-0.5, 0.1)	0.22	48.5%	48.4%	-0.4** (0.1)	(-0.6, -0.1)	0.01
PY 1 through 4	46.5%	46.5%	-0.2** (0.1)	(-0.3, 0.0)	0.04	45.5%	46.0%	-0.1 (0.1)	(-0.3, 0.1)	0.31	47.3%	47.0%	-0.2* (0.1)	(-0.4, 0.0)	0.06
Reversed Bice-Boxerman fragmentation of care index															
Baseline	77.7	77.9	NA	NA	NA	78.7	78.3	NA	NA	NA	76.8	77.6	NA	NA	NA
PY 1	78.6	78.8	0.1 (0.1)	(0.0, 0.2)	0.29	79.7	79.2	0.1 (0.1)	(-0.1, 0.2)	0.56	77.8	78.5	0.1 (0.1)	(-0.1, 0.2)	0.39
PY 2	79.7	79.8	0.1* (0.1)	(0.0, 0.3)	0.08	80.7	80.1	0.2 (0.1)	(0.0, 0.4)	0.14	78.8	79.5	0.1 (0.1)	(-0.1, 0.3)	0.30
PY 3	80.5	80.6	0.1 (0.1)	(0.0, 0.3)	0.15	81.5	81.0	0.1 (0.1)	(-0.1, 0.3)	0.44	79.6	80.2	0.2 (0.1)	(-0.1, 0.4)	0.23
PY 4	80.7	80.7	0.2 (0.1)	(0.0, 0.4)	0.12	81.6	81.2	0.0 (0.2)	(-0.2, 0.3)	0.78	79.9	80.4	0.3* (0.2)	(0.0, 0.5)	0.09
PY 1 through 4	79.9	80.0	0.1* (0.1)	(0.0, 0.3)	0.10	80.9	80.4	0.1 (0.1)	(-0.1, 0.3)	0.41	79.1	79.7	0.2 (0.1)	(0.0, 0.3)	0.16
Across all PCPs and specialists providing care to a patient, where all practitioners in the beneficiary's assigned practice are treated as a single practitioner:															
Percentage of visits with the usual provider of care (UPC)															
Baseline	51.3%	51.1%	NA	NA	NA	50.1%	50.6%	NA	NA	NA	52.3%	51.4%	NA	NA	NA
PY 1	50.3%	50.0%	0.1 (0.1)	(-0.1, 0.2)	0.51	49.2%	49.6%	0.1 (0.1)	(-0.1, 0.3)	0.34	51.1%	50.3%	0.0 (0.1)	(-0.2, 0.2)	0.97
PY 2	48.6%	48.4%	-0.1 (0.1)	(-0.2, 0.1)	0.56	47.6%	48.1%	0.0 (0.1)	(-0.3, 0.2)	0.81	49.4%	48.7%	-0.1 (0.1)	(-0.3, 0.1)	0.57
PY 3	48.6%	48.4%	0.0 (0.1)	(-0.2, 0.2)	0.83	47.7%	48.0%	0.2 (0.2)	(-0.1, 0.6)	0.29	49.3%	48.7%	-0.2 (0.2)	(-0.5, 0.0)	0.15
PY 4	50.4%	50.5%	-0.3** (0.2)	(-0.6, -0.1)	0.04	49.5%	50.1%	-0.1 (0.2)	(-0.5, 0.3)	0.70	51.1%	50.8%	-0.5*** (0.2)	(-0.9, -0.2)	0.01
PY 1 through 4	49.4%	49.3%	-0.1 (0.1)	(-0.3, 0.1)	0.33	48.5%	49.0%	0.1 (0.2)	(-0.2, 0.3)	0.74	50.2%	49.6%	-0.2* (0.1)	(-0.4, 0.0)	0.08

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Reversed Bice-Boxerman fragmentation of care index															
Baseline	74.1	74.5	NA	NA	NA	75.4	74.7	NA	NA	NA	73.0	74.2	NA	NA	NA
PY 1	75.1	75.6	-0.1 (0.1)	(-0.2, 0.1)	0.51	76.3	75.7	-0.1 (0.1)	(-0.4, 0.1)	0.27	74.2	75.4	0.0 (0.1)	(-0.2, 0.2)	0.91
PY 2	76.9	77.2	0.1 (0.1)	(-0.1, 0.2)	0.51	78.0	77.3	0.0 (0.2)	(-0.2, 0.3)	0.85	76.0	77.1	0.1 (0.1)	(-0.1, 0.3)	0.49
PY 3	76.9	77.2	0.0 (0.1)	(-0.2, 0.2)	0.95	77.9	77.5	-0.3 (0.2)	(-0.7, 0.1)	0.29	76.0	77.0	0.2 (0.2)	(-0.1, 0.5)	0.20
PY 4	77.8	77.9	0.3 (0.2)	(0.0, 0.6)	0.16	78.9	78.3	-0.1 (0.3)	(-0.6, 0.4)	0.77	77.0	77.7	0.5** (0.3)	(0.1, 1.0)	0.03
PY 1 through 4	76.7	77.0	0.1 (0.1)	(-0.1, 0.2)	0.54	77.8	77.3	-0.1 (0.2)	(-0.4, 0.2)	0.50	75.9	76.9	0.2 (0.1)	(0.0, 0.4)	0.12
Unweighted sample sizes for percentage of primary care ambulatory visits at assigned practice[c]															
Number of beneficiaries	1,495,746	3,537,524				668,491	1,775,317				830,076	1,770,729			
Number of beneficiary-years	4,674,040	10,954,436				2,067,988	5,501,539				2,606,052	5,452,897			
Unweighted sample sizes for percentage of visits with the usual provider of care[c]															
Number of beneficiaries	1,527,234	3,622,621				683,131	1,818,501				847,068	1,813,087			
Number of beneficiary-years	4,886,215	11,509,482				2,165,836	5,777,539				2,720,379	5,731,943			
Unweighted sample sizes for fragmentation of care index[c]															
Number of beneficiaries	1,369,908	3,248,233				612,741	1,637,597				759,551	1,618,075			
Number of beneficiary-years	3,985,652	9,375,442				1,769,071	4,740,953				2,216,581	4,634,489			
Other quality of care															
Percentage of index acute care hospital discharges that were followed by an unplanned readmission within 30 days															
Baseline	15.6%	15.8%	NA	NA	NA	15.8%	15.9%	NA	NA	NA	15.5%	15.7%	NA	NA	NA
PY 1	15.7%	15.9%	0.0 (0.2)	(-0.3, 0.2)	0.75	16.1%	16.2%	0.0 (0.2)	(-0.4, 0.3)	0.94	15.3%	15.7%	-0.1 (0.2)	(-0.4, 0.3)	0.72
PY 2	15.9%	16.0%	0.0 (0.2)	(-0.2, 0.3)	0.86	16.2%	16.0%	0.3 (0.2)	(-0.1, 0.6)	0.17	15.6%	16.0%	-0.2 (0.2)	(-0.6, 0.2)	0.39
PY 3	15.9%	16.2%	-0.1 (0.2)	(-0.4, 0.2)	0.57	16.1%	16.1%	0.1 (0.2)	(-0.3, 0.5)	0.70	15.6%	16.2%	-0.2 (0.2)	(-0.6, 0.1)	0.27

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 4	16.0%	16.1%	0.1 (0.2)	(-0.1, 0.4)	0.36	16.3%	15.9%	0.5** (0.2)	(0.2, 0.9)	0.02	15.8%	16.2%	-0.1 (0.2)	(-0.5, 0.2)	0.57
PY 1 through 4	15.9%	16.0%	0.0 (0.1)	(-0.2, 0.2)	0.97	16.2%	16.1%	0.2 (0.2)	(-0.1, 0.5)	0.25	15.6%	16.0%	-0.2 (0.2)	(-0.5, 0.2)	0.40
Percentage of index acute care hospital discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days															
Baseline	25.8%	26.1%	NA	NA	NA	25.7%	25.9%	NA	NA	NA	26.0%	26.2%	NA	NA	NA
PY 1	25.9%	26.2%	0.0 (0.2)	(-0.3, 0.3)	0.84	25.9%	26.2%	-0.1 (0.3)	(-0.5, 0.3)	0.76	25.9%	26.2%	0.0 (0.2)	(-0.4, 0.4)	0.99
PY 2	26.1%	26.3%	0.0 (0.2)	(-0.3, 0.3)	0.96	26.0%	26.1%	0.2 (0.3)	(-0.3, 0.6)	0.51	26.1%	26.6%	-0.2 (0.2)	(-0.6, 0.3)	0.53
PY 3	26.2%	26.5%	-0.1 (0.2)	(-0.4, 0.2)	0.75	26.0%	26.2%	0.0 (0.3)	(-0.4, 0.5)	0.87	26.3%	26.7%	-0.1 (0.2)	(-0.5, 0.3)	0.57
PY 4	25.5%	25.8%	0.0 (0.2)	(-0.3, 0.3)	0.90	25.3%	25.4%	0.1 (0.3)	(-0.3, 0.6)	0.62	25.7%	26.0%	-0.1 (0.3)	(-0.5, 0.4)	0.82
PY 1 through 4	25.9%	26.2%	0.0 (0.1)	(-0.3, 0.2)	0.83	25.8%	26.0%	0.1 (0.2)	(-0.3, 0.4)	0.79	26.0%	26.4%	-0.1 (0.2)	(-0.4, 0.3)	0.68
Percentage of index ED (including observation stay) discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days															
Baseline	29.4%	29.7%	NA	NA	NA	28.6%	28.9%	NA	NA	NA	29.9%	30.4%	NA	NA	NA
PY 1	29.1%	29.5%	0.0 (0.2)	(-0.3, 0.3)	0.96	28.4%	28.8%	-0.1 (0.3)	(-0.6, 0.3)	0.65	29.6%	29.9%	0.1 (0.2)	(-0.3, 0.5)	0.60
PY 2	29.1%	29.5%	0.0 (0.2)	(-0.3, 0.3)	0.92	28.5%	28.5%	0.4 (0.3)	(-0.1, 0.8)	0.18	29.5%	30.3%	-0.3 (0.2)	(-0.7, 0.1)	0.22
PY 3	29.3%	29.6%	0.1 (0.2)	(-0.3, 0.4)	0.70	28.9%	28.5%	0.6** (0.3)	(0.1, 1.1)	0.04	29.6%	30.4%	-0.3 (0.3)	(-0.8, 0.1)	0.24
PY 4	29.6%	29.6%	0.4* (0.2)	(0.1, 0.8)	0.05	29.2%	28.8%	0.7** (0.3)	(0.1, 1.2)	0.05	29.9%	30.1%	0.3 (0.3)	(-0.2, 0.7)	0.36
PY 1 through 4	29.3%	29.6%	0.1 (0.2)	(-0.2, 0.4)	0.53	28.7%	28.7%	0.4 (0.2)	(0.0, 0.8)	0.14	29.7%	30.2%	-0.1 (0.2)	(-0.4, 0.3)	0.67
Percentage of 65 and older Medicare FFS beneficiaries who received two or more prescriptions for high risk medications in the same class															
Baseline	11.9%	11.8%	NA	NA	NA	11.6%	11.1%	NA	NA	NA	12.1%	12.3%	NA	NA	NA
PY 1	12.1%	12.1%	0.0 (0.1)	(-0.1, 0.1)	0.55	11.9%	11.5%	-0.1 (0.1)	(-0.2, 0.1)	0.41	12.3%	12.6%	0.0 (0.1)	(-0.2, 0.1)	0.92
PY 2	12.0%	11.9%	-0.1 (0.1)	(-0.2, 0.1)	0.37	11.7%	11.3%	-0.1 (0.1)	(-0.2, 0.1)	0.36	12.2%	12.4%	0.0 (0.1)	(-0.2, 0.1)	0.71
PY 3	14.1%	14.0%	0.0 (0.1)	(-0.1, 0.2)	0.62	13.9%	13.4%	0.1 (0.1)	(-0.1, 0.3)	0.57	14.2%	14.5%	0.0 (0.1)	(-0.2, 0.2)	0.85
PY 4	14.0%	13.8%	0.1 (0.1)	(-0.1, 0.2)	0.57	13.7%	13.2%	0.0 (0.1)	(-0.2, 0.2)	0.95	14.2%	14.3%	0.1 (0.1)	(-0.1, 0.3)	0.34
PY 1 through 4	13.1%	13.0%	0.0 (0.1)	(-0.1, 0.1)	1.00	12.9%	12.4%	0.0 (0.1)	(-0.2, 0.1)	0.81	13.3%	13.5%	0.0 (0.1)	(-0.1, 0.2)	0.80

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Percentage of beneficiaries receiving hospice services															
Baseline	2.8%	2.7%	NA	NA	NA	2.7%	2.6%	NA	NA	NA	2.8%	2.8%	NA	NA	NA
PY 1	2.8%	2.7%	0.0 (0.0)	(0.0, 0.1)	0.16	2.7%	2.6%	0.0 (0.0)	(-0.1, 0.1)	0.75	2.8%	2.8%	0.1 (0.0)	(0.0, 0.1)	0.12
PY 2	3.0%	2.8%	0.1*** (0.0)	(0.1, 0.2)	0.00	2.9%	2.8%	0.1* (0.0)	(0.0, 0.2)	0.09	3.0%	2.9%	0.2*** (0.0)	(0.1, 0.3)	0.00
PY 3	3.1%	3.0%	0.1*** (0.0)	(0.1, 0.2)	0.00	3.1%	2.9%	0.1** (0.1)	(0.0, 0.2)	0.02	3.2%	3.0%	0.2*** (0.1)	(0.1, 0.3)	0.00
PY 4	3.3%	3.2%	0.1*** (0.0)	(0.0, 0.2)	0.01	3.2%	3.1%	0.1 (0.1)	(0.0, 0.2)	0.19	3.3%	3.2%	0.1** (0.1)	(0.0, 0.2)	0.01
PY 1 through 4	3.1%	2.9%	0.1*** (0.0)	(0.1, 0.2)	0.00	3.0%	2.9%	0.1 (0.0)	(0.0, 0.1)	0.11	3.1%	3.0%	0.1*** (0.0)	(0.1, 0.2)	0.00
Length of hospice stay, in days (for beneficiaries receiving hospice services)															
Baseline	62	67	NA	NA	NA	59	64	NA	NA	NA	65	70	NA	NA	NA
PY 1	62	66	0.7 (1.0)	(-1.0, 2.4)	0.52	59	65	0.4 (1.6)	(-2.2, 3.0)	0.81	64	67	0.9 (1.4)	(-1.3, 3.1)	0.50
PY 2	66	69	2.5** (1.1)	(0.7, 4.4)	0.02	63	66	2.9* (1.7)	(0.2, 5.7)	0.08	68	71	2.3 (1.5)	(-0.2, 4.8)	0.13
PY 3	71	72	3.8*** (1.1)	(1.9, 5.6)	0.00	69	70	5.0*** (1.6)	(2.3, 7.7)	0.00	73	74	3.0* (1.6)	(0.4, 5.6)	0.06
PY 4	69	72	2.5** (1.2)	(0.6, 4.5)	0.03	68	70	4.0** (1.7)	(1.1, 6.8)	0.02	70	73	1.8 (1.7)	(-1.0, 4.6)	0.29
PY 1 through 4	67	70	2.5*** (1.0)	(0.9, 4.1)	0.01	65	68	3.2** (1.4)	(0.9, 5.5)	0.02	69	72	2.1 (1.3)	(-0.1, 4.3)	0.11
Length of hospice stay, in days (for all beneficiaries)															
Baseline	1.7	1.8	NA	NA	NA	1.6	1.7	NA	NA	NA	1.8	2.0	NA	NA	NA
PY 1	1.7	1.8	0.0 (0.0)	(0.0, 0.1)	0.17	1.6	1.7	0.0 (0.0)	(-0.1, 0.1)	0.66	1.8	1.9	0.1 (0.0)	(0.0, 0.1)	0.15
PY 2	2.0	1.9	0.2*** (0.0)	(0.1, 0.2)	0.00	1.8	1.8	0.1** (0.1)	(0.0, 0.2)	0.02	2.1	2.0	0.2*** (0.1)	(0.1, 0.3)	0.00
PY 3	2.2	2.1	0.2*** (0.0)	(0.1, 0.3)	0.00	2.1	2.0	0.2*** (0.1)	(0.1, 0.3)	0.00	2.3	2.2	0.2*** (0.1)	(0.1, 0.3)	0.00
PY 4	2.3	2.3	0.2*** (0.0)	(0.1, 0.2)	0.00	2.2	2.1	0.2*** (0.1)	(0.1, 0.3)	0.00	2.4	2.4	0.1** (0.1)	(0.0, 0.3)	0.02
PY 1 through 4	2.1	2.0	0.1*** (0.0)	(0.1, 0.2)	0.00	2.0	1.9	0.1*** (0.0)	(0.1, 0.2)	0.00	2.2	2.1	0.2*** (0.0)	(0.1, 0.2)	0.00
Long-term opioid use[f]															
Baseline	8.1%	7.8%	NA	NA	NA	7.3%	7.1%	NA	NA	NA	8.8%	8.3%	NA	NA	NA
PY 1	7.5%	7.2%	0.0 (0.1)	(-0.1, 0.0)	0.44	6.7%	6.7%	-0.1 (0.1)	(-0.2, 0.0)	0.10	8.1%	7.6%	0.0 (0.1)	(-0.1, 0.1)	0.68

Table 5.A.17 *(continued)*

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
PY 2	6.8%	6.5%	-0.1 (0.1)	(-0.2, 0.1)	0.48	6.0%	6.0%	-0.1 (0.1)	(-0.2, 0.1)	0.51	7.4%	6.9%	0.0 (0.1)	(-0.2, 0.1)	0.98
PY 3	6.0%	5.8%	-0.2** (0.1)	(-0.3, 0.0)	0.03	5.4%	5.4%	-0.2 (0.1)	(-0.4, 0.0)	0.18	6.5%	6.2%	-0.1 (0.1)	(-0.3, 0.0)	0.15
PY 4	5.5%	5.3%	-0.2** (0.1)	(-0.3, 0.0)	0.03	4.9%	4.9%	-0.2 (0.1)	(-0.4, 0.1)	0.26	6.0%	5.6%	-0.2 (0.1)	(-0.4, 0.0)	0.11
PY 1 through 4	6.4%	6.2%	-0.1* (0.1)	(-0.2, 0.0)	0.08	5.7%	5.7%	-0.1 (0.1)	(-0.3, 0.0)	0.20	7.0%	6.5%	-0.1 (0.1)	(-0.2, 0.1)	0.39
Potential opioid overuse[g]															
Baseline	19.6%	19.2%	NA	NA	NA	19.6%	18.9%	NA	NA	NA	19.6%	19.4%	NA	NA	NA
PY 1	17.7%	17.3%	0.0 (0.3)	(-0.4, 0.5)	0.85	18.3%	17.4%	0.2 (0.4)	(-0.4, 0.8)	0.59	17.4%	17.3%	-0.1 (0.3)	(-0.6, 0.5)	0.85
PY 2	15.6%	15.6%	-0.3 (0.3)	(-0.8, 0.2)	0.35	16.6%	16.2%	-0.4 (0.5)	(-1.3, 0.5)	0.52	15.0%	15.0%	-0.1 (0.4)	(-0.8, 0.6)	0.76
PY 3	13.5%	14.1%	-1.1*** (0.4)	(-1.6, -0.5)	0.00	14.6%	14.6%	-0.7 (0.6)	(-1.7, 0.3)	0.25	12.7%	13.7%	-1.2** (0.5)	(-1.9, -0.4)	0.01
PY 4	12.6%	12.8%	-0.7* (0.4)	(-1.3, -0.0)	0.08	13.6%	13.8%	-0.9 (0.6)	(-2.0, 0.1)	0.13	11.9%	12.2%	-0.4 (0.5)	(-1.2, 0.4)	0.40
PY 1 through PY 4	14.9%	15.0%	-0.5* (0.3)	(-0.9, 0.0)	0.09	15.9%	15.6%	-0.4 (0.4)	(-1.1, 0.3)	0.36	14.3%	14.6%	-0.4 (0.3)	(-0.9, 0.2)	0.29
Unweighted sample sizes for other quality of care measures															
Number of index discharges for readmission	1,423,143	3,297,780				652,580	1,662,207				770,563	1,635,573			
Number of index ED discharges	2,543,444	6,022,446				1,091,951	2,892,820				1,451,493	3,129,626			
Number of 65 and older Medicare FFS beneficiaries for the high-risk medication measure	1,084,779	2,553,220				499,055	1,300,064				587,740	1,259,087			
Number of beneficiaries for length of hospice stay	142,248	315,966				62,086	156,462				80,183	159,550			

Table 5.A.17 ***(continued)***

	Track 2—Overall					Track 2—SSP					Track 2—Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90% confidence interval	*p*-Value
Number of beneficiaries for long-term opioid use	1,100,836	2,604,604				496,717	1,309,576				606,187	1,301,024			
Number of beneficiaries for potential opioid overuse	99,958	219,993				40,467	104,319				59,646	116,065			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: For the quality-of-care outcomes, we present the absolute impact estimate only. We do so because, given the low means for the outcome measures, percentage impacts for some of the binary outcomes are likely to be misleadingly large.

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources on model implementation.

We grouped the claims-based quality-of-care measures into separate domains according to the Comprehensive Primary Care Functions under which they appear in the 2018 CPC+ Implementation Guide (CMMI 2018).

[a] We report the actual, unadjusted averages in the baseline period that are similar for the CPC+ and comparison groups due to matching. In the intervention period, the comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices and controlling for beneficiary characteristics and practice fixed-effects.

[c] The numbers of CPC+ Track 2 and comparison practices are the same here as in Tables 5.A.10 and 5.A.15; they are therefore not reported separately in this table. The beneficiary-level measures for the recommended services for diabetes, breast cancer screening, and continuity of care are affected only by matching weights (and not by time observed) because the measures require beneficiaries to have one full year of eligibility in each program year. For the measures presented in this table, after accounting for matching weights, the effective sample size of the comparison group is 38 to 45 percent the size of the actual comparison group.

[d] These measures require that beneficiaries be continuously enrolled in Medicare FFS Parts A and B as well as in Medicare Part D and not use hospice services during the measurement year.

[e] The continuity of care measures are calculated for beneficiaries who: were in the ITT sample at the beginning of the year, were FFS-eligible for the full year in each program year, and had qualifying ambulatory visits in the program year. Qualifying ambulatory visits were (1) office or other outpatient visits for E&M; (2) ophthalmological services for medical examination and evaluation; and (3) new enrollee and annual wellness visits.

[f] To be included in the analysis of both long-term opioid use and potential overuse, a beneficiary had to (1) be assigned to a practice; (2) be continuously enrolled in Medicare Parts A, B, and D throughout each calendar year, or until death; and (3) have at least one opioid prescription during the measurement year. We also excluded beneficiaries for whom opioid use is appropriate: beneficiaries with a diagnosis of cancer during or one year before the measurement year, those with a diagnosis of sickle cell disease, or those with hospice use during the measurement year. The regression models for both opioid use outcomes also control for changes in state-level PDMP characteristics and opioid funding.

Table 5.A.17 ***(continued)***

[g] This measure is only defined among long-term users of opioids.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; E&M = evaluation and management; FFS = fee-for-service; ITT = intent-to-treat; NA = not applicable; NPI = National Provider Identifier; PDMP = prescription drug monitoring program; PY = Program Year; SE = standard error; SSP = Medicare Shared Savings Program.

D. Aggregate impact estimates for key outcomes

As we did for Track 1, we translated beneficiary-level impact estimates into aggregate estimates—for example, the total estimated dollar amount of reductions in Medicare expenditures, or the total number of ED visits avoided among Medicare FFS beneficiaries receiving the intervention. For the five outcome measures listed in Table 5.A.18, we present aggregate impact estimates for the first four program years combined for all Medicare FFS beneficiaries assigned to Track 2 practices. Consistent with the estimated impacts, the statistically significant estimates over the first four program years were (1) an increase of over 1.3 billion dollars in Medicare expenditures, including enhanced payments; (2) a relative reduction of 14,271 hospitalizations; and (3) a relative reduction of 36,447 outpatient ED visits. There were no effects on Medicare expenditures, excluding CMS's enhanced payments, or on 30-day readmissions.

Table 5.A.18. Aggregate impact estimates for key outcomes over the first four years of CPC+: Track 2

Outcome	Estimate	90 percent CI lower bound	90 percent CI upper bound
Medicare expenditures, including Comprehensive Primary Care Payments and excluding CMS's enhanced payments[a]	$30,035,821	-$292,068,927	$352,140,570
Medicare expenditures, including Comprehensive Primary Care Payments and CMS's enhanced payments[a]	***$1,317,578,132***	$999,536,564	$1,635,619,699
Hospitalizations	***-14,271***	-25,552	-2,991
Outpatient ED visits	***-36,447***	-55,283	-17,610
30-day readmissions[b]	59	-2,404	2,522

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: This table calculates the overall estimated effects on attributed Medicare FFS beneficiaries who were in the intent-to-treat analysis sample in Track 2 practices during the first four years of CPC+. The total number of beneficiaries attributed to Track 2 practices in the annual analysis sample during the intervention period was 1,456,841. These beneficiaries had 39,593,451 eligible beneficiary months and 884,822 eligible index discharges (for readmissions) over the first four years of CPC+. Impact estimates (shown in Tables 5.A.10, 5.A.15, and 5.A.17) are from difference-in-differences regressions using practice fixed-effects and patient-level control variables from the pre-CPC+ period shown. **Yellow shading** with ***bold, italicized text*** signifies that the estimate was statistically significant at the $p < 0.10$ level.

[a] Medicare Part A and B expenditures without CMS's enhanced payments also include base CPCPs for Track 2 practices, but not the 10 percent comprehensiveness supplement. We include CPCPs in Part B spending because Track 2 practices agreed to lower Part B payments for evaluation and management services in exchange for CPCPs. Expenditures for Part A and B services in PY 3 and PY 4 include QPP payment adjustments in 2019 and 2020, which were based on practitioner performance in, respectively, 2017 and 2018. QPP payment adjustments include (1) MIPS adjustments, which were applied directly to physician and outpatient claims in 2019 and 2020 (as a percentage of the charges on the claims), and (2) lump-sum incentive payments, which were paid out to eligible practitioners who participated in Advanced APMs in 2017 and 2018; they were calculated based on applicable physician and outpatient claims for these practitioners in, respectively, 2018 and 2019. Note that the first QPP adjustments occurred in 2019 (two years after the start of QPP), so there are no QPP payments in the years before 2019.

[b] In the impact analysis, this outcome represents the percentage of discharges with an unplanned readmission within 30 days of the discharge. For this table, we translated the impact estimate into the total number of discharges for which the initiative affected readmissions.

APM = Alternative Payment Model; CI = confidence interval; CPCP = Comprehensive Primary Care Payment; ED = emergency department; FFS = fee-for-service; QPP = Quality Payment Program.

5.B. Attribution methodology

In this Appendix, we explain beneficiary attribution (Section 1), describe each step of the attribution approach we use for CPC+ and comparison practices (Section 2), and discuss how the methodology has changed over time (Section 3). We then compare how our evaluation attribution process differs from CMS's payment attribution (Section 4). Finally, we explore similarities between our evaluation attribution sample and CMS's payment attribution sample (Section 5). We updated the reported number of attributed beneficiaries, by quarter or year, based on the latest attribution run for this report.

5.B.1. What is beneficiary attribution?

Attribution is a methodology used to identify the population of beneficiaries under the care of a particular practitioner, practice, or health system. CPC+ provides each participating practice site with enhanced and alternative payments for their Medicare fee-for-service (FFS) beneficiaries. A practice site is composed of a unique grouping of practitioners and billing numbers (described in more detail below). To determine the amount of payments practices receive, CMS uses attribution to measure the size and acuity of the Medicare FFS population receiving regular, continuous care from the practice. The CPC+ payment attribution process uses Medicare administrative data (claims and enrollment data) to identify the Medicare FFS beneficiaries associated with CPC+ practices.[35,36]

As a part of the evaluation of CPC+, we use a similar claims-based attribution process to assign Medicare beneficiaries to all primary care practice sites serving Medicare beneficiaries in a given quarter. We run our own attribution so we can attribute Medicare beneficiaries to both CPC+ and comparison practices using an identical methodology. We assign eligible Medicare beneficiaries to practice sites for each quarter of the time period we are analyzing. For the fourth annual report, this period includes 4 baseline quarters in 2016 and 16 intervention quarters in 2017, 2018, 2019, and 2020 for the 2017 Starters.[37] Although we use a process similar to CMS payment attribution, there are a few key differences that we highlight in Section 5.B.4.

5.B.2. How do we do attribution?

Like the CMS payment attribution method, attribution for the CPC+ evaluation uses Medicare administrative data to assign Medicare FFS beneficiaries to CPC+ and comparison practice sites. The CPC+ evaluation attribution process consists of five steps. First, we identify a pool of primary care practices that compete for beneficiaries in the attribution process. Second, because we use Medicare claims, which report the practitioners who provided the service rather than the practice, we group practitioners into the practices identified in the first step. Third, we identify

[35] See CMS's CPC+ Payment Methodologies at https://innovation.cms.gov/media/document/cpc-plus-payment-methodology-py2020 for details on CPC+ payment attribution (Chapter 2). In Section 5.B.4 below, we summarize the differences between the payment and evaluation attribution processes.

[36] Starting in 2019, CMS incorporated Voluntary Alignment, a method by which beneficiaries confirm their primary care practitioner, into CPC+ attribution methodology.

[37] Beneficiaries are assigned to the first practice they are attributed to in that period (i.e., the baseline or the intervention period).

the set of beneficiaries who are eligible for attribution. Fourth, we identify the set of primary care services that we consider in the attribution process. Fifth, we use the information from the previous four steps to attribute eligible Medicare beneficiaries to a single practice in each quarter.

Below we describe each of these steps in detail.

Step 1: Identify a pool of primary care practices

To develop a frame of primary care practices that compete for beneficiaries in the attribution process, we start with a roster of all practices in the United States with at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a primary care specialty (defined as family practice, general practice, geriatrics, or internal medicine). We purchase yearly rosters from IQVIA, a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the country, including practices' names and addresses along with the name, specialty, and National Provider Identifier (NPI) of each practitioner at the practice site.[38] We augment the IQVIA data with practitioner taxonomy and Medicare specialty codes and fill in missing NPIs by linking the practitioner-level IQVIA data to the National Plan and Provider Enumeration System (NPPES). We then identify CPC+ practices within the roster of IQVIA practices, using a combination of address, name, and practitioner matching. If we cannot identify a CPC+ practice in the IQVIA roster, we augment the IQVIA data by appending CPC+ practice and practitioner data from CMS.

Step 2: Group practitioners into practice sites

Two key inputs in attribution are a roster of practitioners working at practice sites and the information they use to bill Medicare for services provided at those practice sites. In the CMS payment attribution method for CPC+, a practice is defined by the combinations of Taxpayer Identification Number (TIN) (or CMS Certification Number (CCN) for critical access hospitals) and NPIs identified for each practitioner at the practice site. Participating CPC+ practices submit this information in monthly rosters. Each service in the Medicare claims data includes (1) the TIN or CCN and (2) the NPI of the practitioner who rendered the service. CMS determines whether the TIN (or CCN) and NPI combination on the claim match a TIN (or CCN) and NPI combination in a practitioner-practice site roster. If so, the visit is associated with that practice in the CPC+ payment attribution algorithm. Otherwise, CMS assigns that visit to the individual practitioner identified as the single TIN-NPI or CCN-NPI combination.

To facilitate attribution for the evaluation, we proceed with three substeps to construct a roster of practitioners working at all CPC+ and potential comparison practices and their associated TINs (or CCNs) and NPIs.

[38] The purchased yearly rosters were based on SK&A data for the baseline period, PY 1, and PY 2 of CPC+. Starting in 2019, IQVIA discontinued the SK&A data and replaced it with OneKey data. For PY 4, the purchased yearly rosters are based on the OneKey database.

Substep 1: Create initial roster of NPIs from yearly rosters

As a starting point, we use practitioner rosters we purchased from IQVIA for years 2016 through 2020, which provide the practices' roster of practitioners in that year (we use the 2016 roster for the period 2014 through 2016).[39] The rosters connect a unique practice ID to a list of practitioners in each year. Although we had extensive information about CPC+ practices from their applications, for matching purposes, we opted to identify CPC+ practice and practitioner characteristics using the same data source (IQVIA) as we used for the potential comparison practices, both at baseline and over time. This approach removes bias that could result from using different data sources for the two groups, such as more frequent or thorough updates to practitioner rosters in the CPC+ data than in IQVIA data. Over the five-year period examined in the fourth annual report, we found that the IQVIA roster captured 74.3 to 85.9 percent of practitioners in the CPC+ rosters. This finding suggests that, although IQVIA data are not perfectly capturing CPC+ practitioners, our rosters include a high proportion of them. We explore this topic more extensively in Section 5.B.5.

Substep 2: Assign TINs to each practice in roster

Because the IQVIA data do not include the practice or practitioner TINs used in the payment attribution method, we use claims data to assign TINs to each practice.[40] To do so, we use an algorithm that picks the TIN most frequently billed in Medicare claims data for primary care services by the NPIs of primary care practitioners that the IQVIA roster indicates are located at a practice.[41] We start by assigning a single TIN to a practice in each year over the six-year period from 2015 through 2020.[42] We then maintain all TINs previously associated with a practice, resulting in practices with multiple TINs at a given time. Additionally, we backdate the start date of each TIN by one calendar year to ensure we correctly associate claims billed by a practice at some point during the year prior to the practice's new TIN.[43]

[39] Our attribution process uses a two-year lookback period, so we need practitioner rosters for 2014 onward.

[40] For CPC+ applicants, we examined the overlap between the assigned TINs and reported TINs: for 95 percent of applicants, at least one assigned TIN was also on the CPC+ application. Using the assigned TINs in attributing beneficiaries to CPC+ practices (rather than using TINs on the CPC+ application) increases the risk of misattributing beneficiaries to CPC+ practices (if we assigned an incorrect or invalid TIN to that practice).

[41] In practices where at least one practitioner is found to practice only at that practice per the IQVIA data, we limit practitioners used in TIN assignment to these "single-site" practitioners. For practices where there are no single-site practitioners, we use all primary care practitioners associated with the practice in TIN assignment.

[42] We decided not to do TIN assignment for 2014, because we would have had to use a very out-of-date roster (one from October 2016). We were concerned that this would cause a mis-specification of the TIN. Since we maintain all TINs previously associated with the practice, we did not want to include a potentially mis-specified TIN that would be included in all subsequent years. Note, however, that we backdate the TIN assigned in 2015 to 2014.

[43] Specifically, we backdate assigned TINs in this way to avoid cases where the practice switched ownership (and so the TIN changed) midyear. Because we use a plurality approach to assigning TINs to a year, if we did not backdate TINs (for example, by forcing only one TIN to be active during a year) we would not assign the correct practice on up to 50 percent of the claims for that switching year.

Substep 3: Unique NPI/TIN assignment

In some instances, the same NPI and TIN combination occurs at multiple practices identified in the IQVIA data at the same time (approximately 15 percent of all practice-practitioner observations share the same NPI and TIN in the 2020 roster). This occurs when a practitioner works in more than one practice site within a health care system (if the practice sites share the same billing TIN [including historic TINs]). In these cases, we cannot distinguish which practice provided care for a beneficiary. To reconcile duplicate NPI–TIN combinations before attribution, we assign the NPI to one practice using the following hierarchy of rules: (1) if the duplicate occurs between a CPC+ practice and a comparison practice, we assign the duplicate to the CPC+ practice; (2) ascending practice size, as measured by number of primary care practitioners (that is, we assign the NPI to the smaller practice); and (3) random assignment, if the duplicate occurs among practices in the same research group (CPC+ or potential comparison) and of the same size.[44]

This process results in a master practitioner file with a unique crosswalk between NPIs-TINs and their associated practice IDs in each year. We use this crosswalk to map each Medicare service to a particular practice.

Step 3: Identify Medicare beneficiaries eligible for attribution

We start with the list of beneficiaries who had at least one primary care visit (see Step 4 for definition of primary care visits) to any NPI in our master practitioner file (created in Step 2). We then limit the pool of beneficiaries to those who meet the eligibility criteria. To be eligible for evaluation attribution in a given quarter, beneficiaries must meet the following criteria at the start of the quarter, as indicated by the Medicare enrollment database (EDB):[45,46]

1. Be enrolled in both Medicare Part A and Part B,
2. Have Medicare as their primary payer,
3. Not be covered under a Medicare Advantage or other Medicare health plan,
4. Not be incarcerated,
5. Be alive.

These criteria ensure that we can reliably measure beneficiary outcomes in the Medicare FFS data unlike, for example, beneficiaries enrolled in a Medicare Advantage plan.

[44] Consistent with CMS's attribution approach, we prioritize the smaller practice to avoid dropping any practices altogether.

[45] For example, beneficiaries must meet all eligibility criteria on January 1, 2017, to be eligible for evaluation attribution in the first quarter of 2017 (January 1, 2017–March 31, 2017).

[46] The EDB provides information, by month, for beneficiaries enrolled in Medicare, including the parts of Medicare in which they were enrolled—Part A, Part B, or Part C (a health maintenance organization)—whether Medicare was their primary payer of medical bills, whether they were incarcerated, and the date they died, if applicable.

Step 4: Identify primary care claims used in attribution

We next narrow the universe of all billed Medicare services to the primary care services used in beneficiary attribution. There are four criteria for a billed service that determine whether we use it in attribution for a given quarter: (1) the type of claim, (2) date of the claim, (3) type of service, and (4) practitioner. A service must meet all four criteria to be included in the attribution process.

1. Type of claim

For attribution, we use national Medicare FFS Physician and Outpatient claims. Most visits are in the Physician file, except claims submitted by critical access hospitals, which are in the Outpatient file.

2. Date of the claim

We use primary care services that occurred during a 24-month "lookback" period in the attribution process. For each quarter, the lookback period is the 24-month period that ended immediately before the quarter started. For example, we use claims from January 2015 to December 2016 to attribute beneficiaries to CPC+ practices for the first quarter of 2017. Table 5.B.1 lists the lookback periods we used for each quarter in the annual report. Claims for attribution were pulled on May 3, 2018, for the first through fourth quarters of 2016, on March 20, 2020, for the first quarter of 2017 through the fourth quarter of 2018, and on March 29, 2021, for the first quarter of 2019 through the fourth quarter of 2020.

Table 5.B.1. Lookback periods for annual report quarterly beneficiary attribution

Attribution quarter	CPC+ period for 2017 Starters	Lookback period
2016 Q1	Baseline	Jan. 2014–Dec. 2015
2016 Q2	Baseline	Apr. 2014–Mar. 2016
2016 Q3	Baseline	July 2014–June 2016
2016 Q4	Baseline	Oct. 2014–Sept. 2016
2017 Q1	Intervention	Jan. 2015–Dec. 2016
2017 Q2	Intervention	Apr. 2015–Mar. 2017
2017 Q3	Intervention	July 2015–June 2017
2017 Q4	Intervention	Oct. 2015–Sept. 2017
2018 Q1	Intervention	Jan. 2016–Dec. 2017
2018 Q2	Intervention	Apr. 2016–Mar. 2018
2018 Q3	Intervention	July 2016–June 2018
2018 Q4	Intervention	Oct. 2016–Sept. 2018
2019 Q1	Intervention	Jan. 2017–Dec. 2018
2019 Q2	Intervention	Apr. 2017–Mar. 2019
2019 Q3	Intervention	July 2017–June 2019
2019 Q4	Intervention	Oct. 2017–Sept. 2019
2020 Q1	Intervention	Jan. 2018–Dec. 2019
2020 Q2	Intervention	Apr. 2018–Mar. 2020
2020 Q3	Intervention	July 2018–June 2020
2020 Q4	Intervention	Oct. 2018–Sept. 2020

Q = quarter

3. Type of service

Next, we limit claims to eligible primary care services using the Current Procedural Terminology (CPT) code reported on the claim. Table 5.B.2 lists the CPT codes of services that we consider to be related to primary care, following the definition CMS uses for CPC+ payment attribution. A subset of eligible primary care services are related to chronic care management (CCM); these claims receive precedence in the attribution algorithm (described below). For the 2020 quarters, we examined the potential effects of coronavirus 2019 (COVID-19) on evaluation attribution, and how including telehealth procedure codes in the attribution algorithm might alter those effects. We found that using telehealth codes for attribution led to a very small increase in the number of attributed beneficiaries (close to 0 percent in the second quarter and up to 0.4 percent in the last quarter of 2020, in both CPC+ and comparison practices). Therefore, we decided not to include telehealth codes in the evaluation attribution, which is consistent with CMS's decision for payment attribution for 2020 quarters (and past quarters as well).

Table 5.B.2. Primary care services eligible for attribution

Type of service	Service	CPT codes
All primary care	Office/outpatient visit evaluation and management (E&M)	99201–99205 99211–99215
	Home care	99324-99328 99334–99337 99339–99345 99347–99350
	Welcome to Medicare and Annual Wellness visits	G0402, G0438, G0439
	Advance care planning	99497
	Collaborative care model	G0502–G0504[a] 99492, 99493, 99494[b]
	Cognition and functional assessment for patient with cognitive impairment	G0505[a], 99483[b]
	Outpatient clinic visit for assessment and management (CAHs only)	G0463
	Transitional care management services	99495–99496
CCM-related service	CCM services	99490, 99491[c]
	Complex CCM services	99487, 99488[d]
	Assessment/care planning for patients requiring CCM services	G0506[a]
	Care management services for behavioral health conditions	G0507[a], 99484[b]
	Prolonged services without face-to-face contact	99358[a]

[a] Added effective January 1, 2017.

[b] Added effective January 1, 2018.

[c] Added effective January 1, 2019.

[d] Discontinued effective January 1, 2017.

CAH = critical access hospital; CCM = chronic care management, CPT = Current Procedural Terminology.

4. Practitioner

Only claims that have a practitioner who is one of the following are included in the attribution process:

- A practitioner in IQVIA data who is part of a practice with at least one practitioner with a primary care specialty (see Steps 1 and 2 for more details).
- A practitioner who is not in IQVIA data but has a primary or secondary primary care specialty determined by the National Plan and Provider Enumeration System (NPPES; see Table 5.B.3 for the list of primary care specialty codes that we and CMS use).
- Any practitioner if the claim is for a CCM service (lower half of Table 5.B.2).

Additionally, we limit claims to services that are reported in the physician (carrier) claims or are from critical access hospitals in the outpatient claims. Like CMS's payment attribution approach, this process excludes claims from federally qualified health centers (FQHCs) and rural health clinics (RHCs).[47]

[47] This restriction means that in both payment and evaluation attribution, even if beneficiaries have most of their visits at an FQHC or RHC, they would not be attributed to a practice that is an FQHC or RHC.

Table 5.B.3. Primary care practitioner specialties

Primary care specialty	Taxonomy code
Family Medicine	**207Q00000X**
Adult Medicine	207QA0505X
Geriatric Medicine	207QG0300X
Hospice and Palliative Medicine	207QH0002X
General Practice	**208D00000X**
Internal Medicine	**207R00000X**
Geriatric Medicine	207RG0300X
Hospice and Palliative Medicine	207RH0002X
Clinical Nurse Specialist	**364S00000X**
Acute Care	364SA2100X
Adult Health	364SA2200X
Chronic Care	364SC2300X
Community Health/Public Health	364SC1501X
Family Health	364SF0001X
Gerontology	364SG0600X
Holistic	364SH1100X
Women's Health	364SW0102X
Nurse Practitioner	**363L00000X**
Acute Care	363LA2100X
Adult Health	363LA2200X
Community Health	363LC1500X
Family	363LF0000X
Gerontology	363LG0600X
Primary Care	363LP2300X
Women's Health	363LW0102X
Physician Assistant	**363A00000X**
Medical	363AM0700X

Source: CMS's CPC+ Payment Methodologies, at https://innovation.cms.gov/media/document/cpc-plus-payment-methodology-py2020.

Notes: Blue shading indicates a specialty category. The non-shaded rows are sub-specialties of the prior blue-shaded category.

Step 5: The attribution algorithm

After we identify beneficiaries eligible for attribution and pull all eligible primary care services (as determined by type of claim, date of the claim, the type of service, and the practitioner), we apply the CPC+ payment attribution algorithm used by CMS. There are three parts to the attribution algorithm:

1. Attribution based on CCM-related billing

If a beneficiary's ***most recent*** eligible primary care visit in the 24-month lookback period was for CCM-related services, we attribute the beneficiary to the practice that provided that CCM-related service.[48]

2. Attribution based on Annual Wellness Visits or Welcome to Medicare visits

Starting in the first quarter of 2018, if a beneficiary is not attributed on the basis of CCM-related billing, and the beneficiary had an Annual Wellness Visit or a Welcome to Medicare visit in the 24-month lookback period, we attribute the beneficiary to the practice that provided the most recent Annual Wellness Visit or a Welcome to Medicare visit.[49]

3. Attribution based on plurality of eligible primary care services

If a beneficiary is not attributed on the basis of Annual Wellness Visits, Welcome to Medicare visit, or CCM-related billing (including cases in which a beneficiary had CCM billed, but the most recent visit was not for CCM-related services), we count the number of eligible primary care visits the beneficiary received from each practice that provided such services. We then attribute the beneficiary to the practice that provided the plurality (that is, the largest share) of eligible primary care visits during the lookback period. If a beneficiary has the same number of eligible primary care visits at more than one practice, we attribute the beneficiary to the practice where the beneficiary had the most recent visit. If two or more of these practices share the same most recent visit date, we attribute the beneficiary to a practice that is on our IQVIA practitioner roster over a primary care NPI that is not on the roster.[50] We break any further ties randomly.

5.B.3. Changes in attribution methodology across annual reports and across quarters

1. We update data and rerun attribution for quarters in the previous annual report that had updates to the input data (for example, we did this for the 2019 quarters in the fourth annual

[48] Because CPC+ care management (indicated by the care management fee) and the CCM are duplicative services, it is important to note that CPC+ practices cannot bill for CCM-related services for their CPC+ payment-attributed beneficiaries. CPC+ practices are free to bill for CCM-related services for non-payment-attributed beneficiaries, which may result in future attribution to the CPC+ practice.

[49] We include the Annual Wellness Visit and Welcome to Medicare visit attribution criteria to the attribution algorithm for the first quarter of 2018 onward, to align with the same change CMS made to the CPC+ payment attribution algorithm.

[50] Although, in a tie, CMS payment attribution gives preference to CPC+ practices, we did not want to favor CPC+ practices over comparison practices.

report). Other than the data changes, the attribution methodology stays the same between reports for a given quarter.

Data changes from the third to the fourth annual report include:

- Backdating TINs from the 2020 TIN assignment to 2019. This impacted 2019 Quarters 2 through 4, for which we used 2019 claims in the lookback period.
- Additional runout of claims, which affected attribution for all quarters in 2019.

These data changes resulted in 2019 quarters showing slightly different attribution samples in going from the third to the fourth annual reports.[51]

2. We alter the attribution approach by quarter to reflect relevant changes in CMS's attribution approach, for example, adding the Annual Wellness Visit criteria starting in the first quarter of 2018.

In addition, annual updates to the Health Care Common Procedure Coding System (HCPCS) or other codes CMS uses and changes in the practitioner roster will affect each quarter's attribution differently, depending on the portion of that year that is in the lookback period for a quarter. For example, adding G0506 (assessment/care planning for patients requiring CCM services) as a CCM service starting on January 1, 2017, affected quarters from the second quarter of 2017 onward, since the second quarter of 2017 is the first quarter that contains 2017 in its lookback period.

[51] The number of attributed beneficiaries in the CPC+ and comparison groups changed minimally. For example, for 2019 Q2, the number of beneficiaries attributed to CPC+ practices increased slightly from 1,812,736, for the third annual report, to 1,817,130 for the fourth annual report, or by 0.2 percent.

5.B.4. How does attribution differ between the CPC+ evaluation and CMS payment?

Our attribution method for the evaluation identifies Medicare beneficiaries assigned to any practice each quarter using roughly the same claims-based attribution algorithm that CMS uses to attribute beneficiaries for CPC+ payments. However, our attribution approach for the evaluation differs from CMS's attribution approach in four key ways:

A. The evaluation practitioner rosters come from IQVIA data for all practices (including CPC+ practices)

For payment attribution, CMS uses CPC+ practitioner rosters (lists of participating practitioners that practices participating in CPC+ submit to CMS) to determine the composition of CPC+ practices and their NPIs and TINs. However, analogous information about practice composition and TINs is not available for comparison practices. Therefore, to maintain consistency in identifying practice composition across CPC+ and comparison practices for the purposes of the evaluation, we use IQVIA's roster to obtain information on NPIs affiliated with a practice. Also, for both CPC+ and comparison practices, we assign TINs to each practice using an algorithm that picks the TIN that was most frequently billed in Medicare claims for primary care services by the NPIs at that practice.

Because we use IQVIA practitioner rosters for all practices, we group non-CPC+ practitioners into primary care practices, whereas payment attribution generally defines non-CPC+ practices as individual practitioners using single TIN-NPI or CCN-NPI combinations (because information regarding how they are grouped as actual practices is not available). The exception is that payment attribution defines practices that applied for CPC+ but were not accepted for CPC+ as practice sites using the practices' application rosters. The evaluation approach allows all non-CPC+ primary care practices in the frame, as well as any individual primary care practitioners not identified in IQVIA data, to compete with CPC+ practices for beneficiaries. This process results in attributing fewer beneficiaries to CPC+ practices than the payment attribution process but likely leads to a more comparable attribution across CPC+ and non-CPC+ practices, because non-CPC+ practices compete for beneficiaries on equal footing with CPC+ practices.

B. The evaluation approach applies fewer restrictions to our definition of an attribution-eligible Medicare beneficiary

In CMS's payment attribution methodology, CMS excludes from attribution: (1) beneficiaries with end-stage renal disease (ESRD) or those enrolled in hospice when they are first attributed (although beneficiaries with ESRD or hospice enrollment can be attributed if they were attributed to a CPC+ practice in an earlier quarter), (2) beneficiaries who are in a long-term care institution, and (3) beneficiaries enrolled in any other program that includes a Medicare FFS shared savings opportunity, except SSP.[52] However, for the evaluation, we do not apply any of these three exclusions in identifying attributed beneficiaries, because CMS expects CPC+ to affect all beneficiaries attributed to the practice, not just those for whom CMS calculates

[52] During 2017 through 2020, the excluded programs included Next Generation ACO, Comprehensive ESRD Care, the Financial Alignment Demonstration, and the Independence at Home Practice Demonstration. Excluded programs may change as CMS launches new initiatives.

payments. In other words, for the evaluation, we want to assess impacts on all beneficiaries who received the plurality of their care from a CPC+ practice relative to similar beneficiaries attributed to comparison practices. Therefore, we think it is appropriate to apply only the eligibility criteria that pertain to the observability of the beneficiary's outcomes in Medicare FFS claims. CMS applies the same eligibility criteria in identifying attributed beneficiaries for payments, although the timing of these checks differs, as we describe below.

C. The evaluation's two-year lookback period begins immediately prior to the start of the quarter

For payment attribution, CMS uses a two-year claims lookback period that ends three months before the start of the quarter, because CMS needs the list of attributed beneficiaries before the start of the quarter to calculate the care management fees and other CPC+ payments, such as the Comprehensive Primary Care Payment for beneficiaries attributed to each CPC+ practice. For the impact analysis, however, the three-month gap between the end of the lookback period and the beginning of the quarter is unnecessary. Our objective is to identify the appropriate sample of attributed beneficiaries in both CPC+ and comparison practices, without the need for calculating payments in real time. Therefore, the two-year claims lookback period for attribution in the impact analysis ends the day before the start of the quarter.

The difference in the claims lookback period also leads to a difference between CMS's approach and the evaluation in the timing of the above-mentioned Medicare FFS eligibility checks. Specifically, CMS checks for eligibility one month before the start of the quarter, and we apply these eligibility criteria at the beginning of the quarter. For example, beneficiaries had to meet all eligibility criteria on December 1, 2017, to be eligible for CMS's payment attribution in the first quarter of 2018 (January 1, 2018–March 30, 2018) but needed to meet the Medicare FFS eligibility criteria as of January 1, 2018, for attribution to the evaluation sample.

D. CMS adjusted its payment attribution methodology over time

Starting with the first quarter of 2018, CMS included the Annual Wellness Visit and Welcome to Medicare visit criteria in its payment attribution process. Although we included this change in our attribution algorithm starting in the first quarter of 2018, it resulted in an additional discrepancy between the evaluation attribution for the fourth quarter of 2017 and payment attribution for the first quarter of 2018, the two quarters with identical claims lookback under each approach. Our attribution for 2017 Quarter 4 (Q4) covers the same lookback period as CMS's payment attribution for 2018 Q1. Because we do not include the Annual Wellness Visit criterion for the 2017 quarters, this could result in additional differences in attribution results between the evaluation sample for 2017 Q4 and payment sample for 2018 Q1, the two quarters with identical claims lookback periods under each attribution algorithm.

Starting with the first quarter of 2019, CMS included an additional criterion based on voluntary assignment in its attribution process, as follows:

- If the beneficiary voluntarily attests that an eligible practitioner is the beneficiary's primary care physician, attribute the beneficiary to that practitioner's practice.

- For remaining beneficiaries, if the most recent primary care service was a CCM-service, attribute beneficiaries to the practice with the most recent CCM-related billing.
- Attribute remaining beneficiaries to the practice with the most recent Annual Wellness Visits or Welcome to Medicare Visits.
- Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.

Because we do not include the voluntary assignment criterion, this could have resulted in additional differences between the evaluation and payment samples in quarters 2018 Q4 to 2020 Q4.[53] However, our preliminary analysis indicates that the extent of this additional discrepancy is very small, as fewer than half of one percent of beneficiaries voluntarily attest to a practitioner. We are unable to replicate the voluntary assignment criterion for the comparison group, so we do not include it in our attribution process for CPC+ or comparison practices.

Starting with the first quarter of 2021, CMS allowed beneficiaries attributed to SSP to also be attributed to CPC+ practices only if they are attributed to the SSP ACO that the CPC+ practice is affiliated with. We did not run attribution for 2021 quarters for the fourth annual report, but our attribution for 2020 Q4 covers the same lookback period as CMS's payment attribution for 2021 Q1. Thus, the percentage of beneficiaries in our evaluation sample who are also in the payment sample could decrease slightly in 2020 Q4, because more beneficiaries are considered ineligible during the lookback period in payment attribution. We do not intend to incorporate this change in our attribution process for two reasons. First, the evaluation attribution only applies the eligibility criteria relevant to the observability of the beneficiary's outcomes in Medicare FFS claims. For example, we require the beneficiary to be alive and enrolled in both Medicare Part A and Part B, as of the start of the quarter. Second, CMS adjusted the payment attribution to make it consistent with the method used in CMS's other primary care initiative, Primary Care First, which is not necessary for the CPC+ evaluation.

The similarities and differences between CMS's approach and the evaluation's approach for beneficiary attribution are summarized in Table 5.B.4.

[53] We compare 2018 Q4 of the evaluation attribution sample and 2019 Q1 of the payment attribution sample because they cover the same lookback period. Therefore, including voluntary assignment to payment attribution in 2019 Q1 impacts the overlap between the evaluation's sample for 2018 Q4 as well.

Table 5.B.4. Similarities and differences between beneficiary attribution for payment versus evaluation through 2020

	Payment attribution	Evaluation attribution
Similarities between payment and evaluation attribution processes		
Frequency of attribution	Quarterly	Same as payment attribution.
Observability criteria for beneficiary eligibility	Be enrolled in Medicare Part A and Part B. Not be covered under a Medicare Advantage or other Medicare health plan. Not be incarcerated. Be alive.	Same as payment attribution.
Criteria used to identify eligible services for attribution	Evaluation and management HCPCS codes.	Same as payment attribution.
Attribution algorithm for 2017 quarters	If the most recent primary care service was a CCM service, attribute beneficiaries to the practice with most recent CCM-related billing. Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.	Same as payment attribution.
Attribution algorithm for 2018 quarters	If the most recent primary care service was a CCM service, attribute beneficiaries to the practice with most recent CCM-related billing. If the most recent visit was not a CCM service, and the beneficiary had an Annual Wellness Visit or a Welcome to Medicare visit, attribute the beneficiary to the practice that had most recent Annual Wellness Visit or Welcome to Medicare visit. Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.	Same as payment attribution.
Differences between payment and evaluation attribution processes		
Attribution algorithm for 2019 and 2020 quarters	If beneficiaries voluntarily attest that an eligible practitioner is their primary care physician, attribute the beneficiaries to that practitioner's practice. For the remaining beneficiaries, if the most recent primary care service was a CCM service, attribute the beneficiaries to the practice with the most recent CCM-related billing. If the most recent visit was not a CCM service, and the beneficiaries had an Annual Wellness Visit or a Welcome to Medicare visit, attribute the beneficiaries to the practice that had the most recent Annual Wellness Visit or Welcome to Medicare visit. Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.	Same as payment attribution, except we cannot approximate voluntary attestation.

Table 5.B.4 ***(continued)***

	Payment attribution	Evaluation attribution
Time period for conducting attribution	Intervention quarters.	Baseline and intervention quarters.
Source for roster of practices and their practitioners	CPC+ practitioner rosters.	IQVIA.
Source for TINs	CPC+ practitioner rosters.	TIN assignment process based on claims.
Practices/practitioners with whom CPC+ practices compete for beneficiaries	Practices rejected from CPC+ and single primary care NPIs not on CPC+ rosters.	All primary care practices from IQVIA roster and single primary care NPIs not on IQVIA roster.
Additional criteria for beneficiary eligibility	Cannot have end-stage renal disease and cannot be enrolled in hospice when they are first attributed. Cannot be in a long-term care institution. Cannot be enrolled in program that includes a Medicare FFS shared savings opportunity, except SSP.	Can have end-stage renal disease or be enrolled in hospice. Can be in a long-term care institution. Can be enrolled in program that includes a Medicare FFS shared savings opportunity.
Time frame for evaluating eligibility criteria	Three months before the start of the quarter for 2017 Q1–2017 Q2. Otherwise, one month before start of quarter.	Day of the start of quarter.
Lookback period for claims used in quarter's attribution process	Two-year period that ends three months before the start of the quarter.	Two-year period that ends immediately before the start of the quarter.
Tie-breaker to determine the practice with the most visits among those that have the same number of visits and same date of most recent visit	Preference given to CPC+ practices over all other practices and NPIs.	No preference given to CPC+ practices relative to comparison practices (all practices on IQVIA roster are given preference over all other single primary care NPIs not on IQVIA roster).

CCM = Chronic Care Management; FFS = fee-for-service; HCPCS = Health Care Common Procedure Coding System; NPI = National Provider Identifier; Q = quarter; SSP = Medicare Shared Savings Program; TIN = Tax Identification Number.

5.B.5. How similar are the evaluation attribution samples to CMS's payment attribution samples?

Given the differences in attribution methodology between CPC+ payment and the CPC+ evaluation, the evaluation is unlikely to attribute 100 percent of the same beneficiaries to CPC+ practices as CMS does for payment attribution. The biggest concern is the difference between using the practitioner rosters and using IQVIA data and TIN assignment—because including different sets of practitioners within practices could lead to large differences in the beneficiaries attributed to the practices.

If there are large differences between the payment attribution sample and the evaluation sample, that could mean that the beneficiaries in our evaluation sample are not actually under the care of

CPC+ practices—and thus they are not expected to be impacted by CPC+.[54] This would lead to attenuation in the impact estimates.

Therefore, it is important to track how well the Medicare beneficiary sample used in the evaluation and the Medicare beneficiary sample used by CMS for payments to CPC+ practices align.

To do this, we implement the following analyses:

First, we calculate the overlap of practitioners assigned to CPC+ practices based on the practitioner roster submitted to CMS and those on the practitioner rosters we develop using data purchased each year from IQVIA to support patient attribution for the evaluation. We used data from IQVIA's SK&A database for the baseline period and the first two years of CPC+, and data from IQVIA's OneKey database starting in PY 3. When we construct our master practice-practitioner file, we use the practice location and practice address to identify practices participating in CPC+ in the data received from IQVIA. However, even though the two data sources might indicate the same practice by practice name and location, there might be important differences in the list of practitioners between the two rosters that would affect beneficiary attribution.

To check the overlap of practitioners across the two rosters, we merge CPC+ program data with IQVIA data by practitioner NPI and report (1) the percentage of practitioners in CPC+ rosters who were found in the IQVIA rosters of these practices and (2) the percentage of practitioners in IQVIA rosters for these practices who were found in the CPC+ rosters. We limit CPC+ rosters to practitioners marked as actively participating in CPC+ to remove practitioners who may have moved to another location. In Table 5.B.5, we compare CPC+ practitioner rosters to IQVIA practitioner rosters at five time points: one month before CPC+ began (December 2016), month 12 of CPC+ (December 2017), month 24 of CPC+ (December 2018), month 36 of CPC+ (December 2019), and month 48 of CPC+ (December 2020). We found 74.3 to 81.0 percent of active practitioners in the CPC+ rosters appeared in the SK&A rosters (Table 5.B.5) between baseline and PY 2 of CPC+, with the percentage overlap declining over time. IQVIA's switch to using the OneKey database for the rosters improved the overlap rate to 85.9 percent in PY 3 and 85.4 percent in PY 4.[55]

The percentage of IQVIA practitioners found as active practitioners in CPC+ rosters declined over time from 82.5 percent at baseline to 62.5 percent by PY 4. This decline over time is partly due to practices withdrawing or being terminated from CPC+. Those practices and their practitioners are removed (marked inactive) from the CPC+ roster but remain part of the intervention sample given the evaluation's intent-to-treat approach.

[54] It is also possible that the CPC+ payment sample might include beneficiaries for whom the practices are not truly responsible; however, once beneficiaries become attributed to a CPC+ practice, that practice has an incentive to make sure they receive high quality care.

[55] We expect that this increase in number of practitioners in the CMS roster who are found in the IQVIA rosters is because the OneKey data capture more practitioners by bringing in data from administrative sources, whereas SK&A relied primarily on phone verification to collect practitioner data.

Note that we do not see a strong decline in the percentage of beneficiaries in the evaluation sample who are also in the payment sample (Table 5.B.6). It remains above 89 percent throughout the intervention period. This makes us less concerned about the decline in the percentage of practitioners in the IQVIA practitioner roster who are also in the CPC+ roster, because the beneficiary overlap is what matters for our beneficiary-level impact analysis.

Table 5.B.5. CMS and IQVIA primary care practitioner roster comparison

Compared rosters	Before CPC+ began (Baseline)	One year after CPC+ began (PY 1)	Two years after CPC+ began (PY 2)	Three years after CPC+ began (PY 3)	Four years after CPC+ began (PY 4)
Number of practices	2,865[a]	2,888	2,888	2,888	2,888
Unique primary care practitioners					
Number of active practitioners in CPC+ roster	12,950	13,342	13,182	13,049	12,962
Number of practitioners in IQVIA roster	12,712	13,299	13,820	17,546	17,700
Percentage of active practitioners in the CPC+ roster also in the IQVIA roster	81.0	78.1	74.3	85.9	85.4
Percentage of practitioners in the IQVIA roster also active in the CPC+ roster	82.5	78.4	70.9	63.9	62.5

Notes: All duplicate NPIs were removed from both rosters. The baseline comparison is based on December 2016 data; the PY 1 comparison uses December 2017 data; the PY 2 comparison uses December 2018 data; the PY 3 comparison uses December 2019 data; and the PY 4 comparison uses December 2020 data. Baseline, PY 1, and PY 2 are based on SK&A data, while PY 3 and PY 4 are based on OneKey data. The IQVIA practitioner roster is restricted to primary care practitioners; we identified a practitioner as primary care using primary and secondary taxonomy codes in the NPPES and specialty information included on Medicare claims over a 12-month lookback period. We do not restrict the CMS rosters since they should already be restricted to primary care practitioners. The IQVIA data rows include 148 practices that we were unable to find in the IQVIA data, but for which we supplemented the IQVIA data with CPC+ roster data.

[a] We were unable to find either SK&A or CMS's CPC+ roster information for 23 practices at baseline. Once the intervention began, we added these practices using the CMS roster from February 2017.

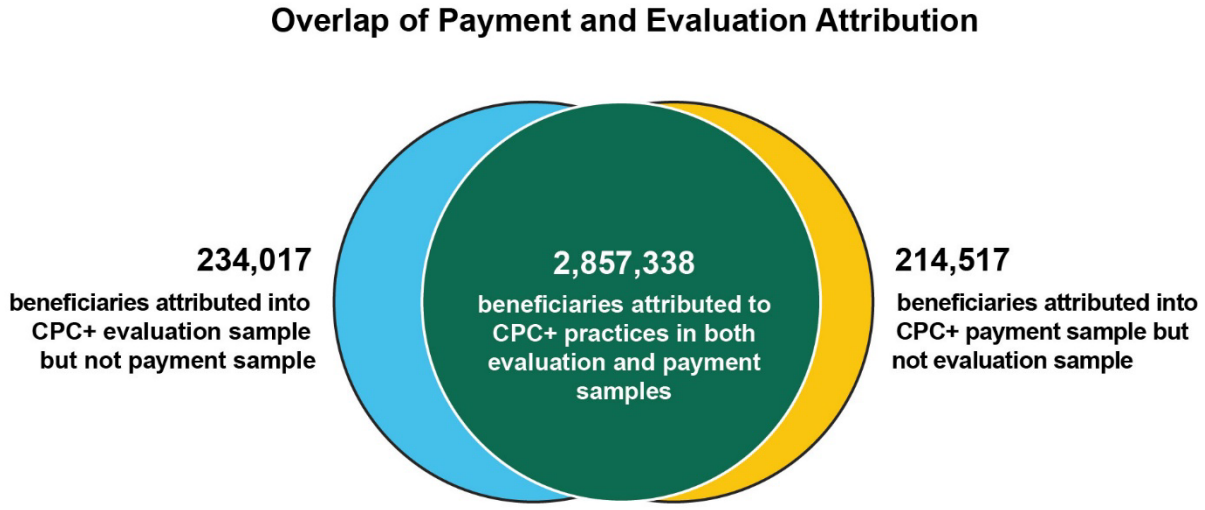
NPPES = National Plan & Provider Enumeration System; PY = Program Year.

Second, we calculate the overlap in beneficiaries attributed to CPC+ practices in the payment and evaluation samples. Due to the differences in the lookback period for a specific calendar quarter (see difference C above in Section 5.B.4), we compare each evaluation sample to the subsequent quarter's payment sample. For example, we compare the evaluation sample from 2017 Q1 (January–March 2017) to the payment sample from 2017 Q2 (April–June 2017). This ensures we are comparing attribution from quarters that use the same lookback period in the payment and evaluation samples. In addition to all the intervention quarters, CMS only ran payment attribution for baseline quarters 2016 Q1 and Q4, so we are unable to compare our attribution for 2016 Q2 and Q3 to the equivalent payment attribution sample.

We found substantial overlap between the sample of beneficiaries ever attributed to CPC+ practices by CMS and by the evaluation over the first four years of the intervention. As we show in Figure 5.B.1, 2,857,338 Medicare beneficiaries were ever attributed to CPC+ practices in both the evaluation sample and the sample CMS used for payment; 214,517 beneficiaries were ever attributed to the CPC+ payment sample but never to the evaluation sample; and 234,017 were ever attributed to the CPC+ evaluation sample but never to the payment sample. More specifically, Table 5.B.6 shows that 89 percent or more of the beneficiaries attributed to 2017 Starter CPC+ practices in our evaluation sample for the first 16 CPC+ quarters were also attributed to the payment attribution sample in the equivalent quarter. Also, 86 to 90 percent of beneficiaries attributed to the payment attribution sample by CMS each quarter were also attributed to CPC+ practices for the evaluation in the equivalent quarter.

Third, using CMS's payment eligibility criteria, we calculate the number of beneficiaries we attribute to CPC+ practices who would have been eligible for payment attribution. This involves additionally limiting the sample to beneficiaries who are not receiving hospice, do not have ESRD, are not institutionalized, and are not enrolled in any other program that includes a Medicare FFS shared savings opportunity, except SSP. Table 5.B.6, column 5, reports the number of beneficiaries in the evaluation sample for each quarter, and column 6 reports the number of beneficiaries in the evaluation sample under CMS's payment eligibility rules. This difference is approximately 40,000 or 2.5 percent of the evaluation sample in a given year.

Figure 5.B.1. Attribution of Medicare FFS beneficiaries during PY 1 through PY 4



Source : Comparison of attributed Medicare FFS beneficiaries in Mathematica's evaluation sample for the first four program years (January 2017 through December 2020) and those in CMS's payment sample for the 2nd through the 17th program quarters (April 2017– March 2021), which used the same set of two-year lookback periods. We used Medicare FFS beneficiary lists provided by CMS to define the payment sample.

FFS = fee-for-service; PY = Program Year.

Table 5.B.6. Beneficiaries attributed to 2017 Starter CPC+ practices, by quarter

Mathematica attribution quarter	Comparison to payment quarter	Beneficiaries in both payment and evaluation samples	Beneficiaries in payment sample	Beneficiaries in evaluation sample	Beneficiaries in evaluation sample under payment eligibility rules	Percentage of beneficiaries in payment sample who are in evaluation sample	Percentage of beneficiaries in evaluation sample who are in payment sample
2016 Q1	2016 Q2	1,489,022	1,655,920	1,651,432	1,609,642	90%	90%
2016 Q2	NA	NA	NA	1,720,593	1,680,865	NA	NA
2016 Q3	NA	NA	NA	1,773,509	1,734,138	NA	NA
2016 Q4	2017 Q1	1,638,668	1,820,621	1,810,383	1,770,994	90%	91%
2017 Q1	2017 Q2	1,607,043	1,795,086	1,767,439	1,723,511	90%	91%
2017 Q2	2017 Q3	1,647,250	1,847,515	1,795,295	1,755,187	89%	92%
2017 Q3	2017 Q4	1,676,565	1,894,700	1,816,139	1,776,977	88%	92%
2017 Q4	2018 Q1[a]	1,668,424	1,937,859	1,833,634	1,794,859	86%	91%
2018 Q1	2018 Q2	1,692,514	1,907,212	1,826,664	1,784,426	89%	93%
2018 Q2	2018 Q3	1,707,502	1,930,223	1,844,365	1,803,384	88%	93%
2018 Q3	2018 Q4	1,716,965	1,950,103	1,856,681	1,815,803	88%	92%
2018 Q4	2019 Q1[b]	1,711,262	1,955,435	1,865,477	1,824,614	88%	92%
2019 Q1	2019 Q2	1,644,951	1,897,910	1,783,729	1,744,840	87%	92%
2019 Q2	2019 Q3	1,666,761	1,915,740	1,817,130	1,778,730	87%	92%
2019 Q3	2019 Q4	1,684,614	1,922,162	1,846,605	1,807,983	88%	91%
2019 Q4	2020 Q1	1,691,486	1,917,936	1,873,191	1,834,481	88%	90%
2020 Q1	2020 Q2	1,641,771	1,850,709	1,814,643	1,776,628	89%	90%
2020 Q2	2020 Q3	1,651,761	1,855,136	1,828,369	1,791,417	89%	90%
2020 Q3	2020 Q4	1,644,775	1,843,779	1,825,073	1,788,879	89%	90%
2020 Q4	2021 Q1[c]	1,630,348	1,822,561	1,838,763	1,803,568	89%	89%

Source: Comparison of attributed Medicare FFS beneficiaries in Mathematica's evaluation sample for the first four program years (January 2017 through December 2020) and those in CMS's payment sample for the 2nd through the 17th program quarters (April 2017– March 2021), which used the same set of two-year lookback periods. We used Medicare FFS beneficiary lists provided by CMS to define the payment sample.

[a] In 2018, CMS changed its attribution rules to prioritize practices in which beneficiaries had their most recent Annual Wellness Visit, which results in additional differences between the evaluation attribution for 2017 Q4 and the payment attribution for 2018 Q1, the two quarters with the same claims lookback period under each attribution algorithm. Starting in 2018 Q1, we incorporated this criterion into the evaluation attribution rules as well.

[b] In 2019, CMS changed its attribution rules to prioritize practices in which beneficiaries had voluntarily assigned themselves, which results in additional differences in attribution.

Table 5.B.6 *(continued)*

[c] In 2021, CMS changed its attribution rules to allow beneficiaries attributed to SSP to also be attributed to CPC+ practices only if they are attributed to the SSP ACO that the CPC+ practice is affiliated with, which results in additional differences between the evaluation attribution for 2020 Q4 and the payment attribution for 2021 Q1, the two quarters with the same claims lookback period under each attribution algorithm.

NA = not available; Q = quarter.

5.C. Specification of measures used in the Medicare impact analysis

In this Appendix, we define the key measures used in this report that are based on Medicare claims and enrollment information. First, we define and discuss the Medicare claims-based outcome measures used in the impact analysis. Next, we describe non-outcome measures based on Medicare claims and enrollment data that we used as control variables in the regression analysis or for other analyses. We also describe updates or changes to outcomes since the third annual report. All updates or changes are applied to all measurement years.

5.C.1. Medicare claims-based outcome measures

Table 5.C.1 summarizes the outcome measures we used in the annual impact analysis in this report. We classified the claims-based outcome measures into groups by Medicare expenditures, service utilization, and three of the five CPC+ functions (improvements in planned care and population health, continuity of care, and comprehensiveness of care). Relative to the third annual report, we added new outcome measures, which are listed along with their motivation in Table 5.C.2.

For each outcome, we show the hypothesized direction of impact in Table 5.C.1. For some measures, the expected direction of effect is indeterminate, because there are multiple mechanisms that could either increase or decrease the outcome, and it is not clear which mechanism would or should outweigh the other. For example, ambulatory specialist visits could increase or decrease, depending on the extent to which more effective care management and follow-up after hospitalizations by CPC+ practices reduce the need for specialist visits or result in more referrals to specialists.

Table 5.C.1. Medicare claims-based outcome measures for the fourth annual report to CMS

	Hypothesized direction of impact
Medicare Parts A and B expenditures (PBPM)	
Excluding enhanced payments[a]	↓
Including CPC+ CMFs[b]	↓ or →
Including CPC+ CMFs, PBIPs, and shared savings payments to SSP ACOs[b]	↓ or →
Monthly Medicare expenditures by service category (PBPM)[c]	
Inpatient: Expenditures for both acute inpatient care (short-stay acute hospitals and CAHs) and non-acute inpatient care (e.g., inpatient rehabilitation services, psychiatric hospital services, etc.)	↓
Expenditures for acute inpatient care[d]	↓
Expenditures for inpatient rehabilitation facilities[e]	↓
Outpatient: Outpatient facility expenditures including those for ED visits (including observation stays), and other outpatient services (e.g., outpatient surgery, imaging, outpatient rehabilitation, and services provided by RHCs and FQHCs)	↓
Expenditures for outpatient ED visits, including observation stays[f]	↓
Physician and nonphysician Part B noninstitutional services: Expenditures including physician services and other services provided by ambulance providers, independent clinical laboratories, and freestanding ambulatory surgical centers[g]	↑ or ↓
Ambulatory visits with primary care practitioners: Expenditures for visits with a primary care practitioner in noninstitutional settings (e.g., office, home, hospital outpatient department, FQHC, RHC, CAH, etc.)	↑ or ↓
Expenditures for ambulatory visits with primary care practitioners; face-to-face visit[h]	↑ or ↓
Expenditures for ambulatory visits with primary care practitioners; non-face-to-face visit[h]	↑ or ↓
Expenditures for ambulatory visits with primary care practitioners at assigned practice[i]	↑ or ↓
Expenditures for ambulatory visits with primary care practitioners at assigned practice; face-to-face visit[h]	↑ or ↓
Expenditures for ambulatory visits with primary care practitioners at assigned practice; non-face-to-face visit[h]	↑ or ↓
Ambulatory visits with specialists: Expenditures for visits with a specialist in noninstitutional settings: (e.g., office, home, hospital outpatient department, FQHC, RHC, or CAH, etc.)	↑ or ↓
Expenditures for ambulatory visits with specialists; face-to-face visit[h]	↑ or ↓
Expenditures for ambulatory visits with specialists; non-face-to-face visit[h]	↑ or ↓
Skilled nursing facility expenditures	↓
Home health expenditures	↑ or ↓
Hospice: Expenditures for hospice providers in both institutional and home settings	↑
Durable medical equipment: Expenditures for DME, such as wheelchairs, home oxygen, and home hospital beds	↑ or ↓
Annualized service use (per 1,000 beneficiaries per year)	
Number of hospitalizations (short-stay acute care and CAHs)	↓
Total number of ED visits, including observation stays (outpatient ED visits and ED visits resulting in a hospitalization)[j]	↓
Number of outpatient ED visits (including observation stays)	↓
Number of primary care substitutable outpatient ED visits[k]	↓
Number of potentially primary care preventable outpatient ED visits[k]	↓
Number of ED visits for injuries that are unlikely to be affected by CPC+[l]	→
Total number of UCC visits	↓
Number of primary care substitutable UCC visits	↓

Table 5.C.1 *(continued)*

	Hypothesized direction of impact
Number of ambulatory primary care visits (including to FQHCs, RHCs, and CAHs)[m]	↑ or ↓
Number of ambulatory primary care visits; face-to-face visit[h]	↑ or ↓
Number of ambulatory primary care visits; non-face-to-face visit[h]	↑ or ↓
Number of ambulatory specialist visits (including to FQHCs, RHCs, and CAHs)[m]	↑ or ↓
Number of ambulatory specialist care visits; face-to-face visit[h]	↑ or ↓
Number of ambulatory specialist care visits; non-face-to-face visit[h]	↑ or ↓
Planned care and population health (annualized)	
Among Medicare FFS beneficiaries ages 18–75 with diabetes, percentage who received:[n]	
Hemoglobin A1c test	↑
Retinal eye exam	↑
Medical attention for nephropathy	↑
Composite measure for receiving all three tests (HbA1c test, retinal eye exam, and medical attention for nephropathy)	↑
Composite measure for receiving none of the three tests	↓
Among female Medicare FFS beneficiaries ages 52–74, percentage who received:[o]	
Breast cancer screening	↑
Among Medicare FFS beneficiaries ages 21 and older: [p]	
Percentage of beneficiaries with cardiovascular disease who were prescribed and filled statin therapy	↑
Among Medicare FFS beneficiaries ages 18 and older: [p]	
Percentage of beneficiaries on diabetes medications with proportion of days covered by medication > 80%	↑
Percentage of beneficiaries on renin-angiotensin system antagonists with proportion of days covered by medication > 80%	↑
Percentage of beneficiaries on statins with proportion of days covered by medication > 80%	↑
Percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed and filled angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) therapy	↑
Continuity of care	
Percentage of primary care ambulatory visits provided at a beneficiary's assigned practice[i,q]	↑ or ↓
Percentage of primary care ambulatory visits at assigned practices; face-to-face visit[h]	↑ or ↓
Percentage of primary care ambulatory visits at assigned practices; non-face-to-face visit[h]	↑ or ↓
Among beneficiaries with qualifying ambulatory visits in the measurement year:[r]	
Across all PCPs and specialists providing care to a patient, where each practitioner in the beneficiary's assigned practice is treated separately:	
Percentage of visits with the usual provider of care (UPC)[s]	↑
Reversed Bice-Boxerman Index (rBBI)[t]	↓
Across all PCPs and specialists providing care to a patient, where all practitioners in the beneficiary's assigned practice are treated as a single practitioner:	
Percentage of visits with the UPC[s]	↑
Reversed Bice-Boxerman Index (rBBI)[t]	↓
Comprehensiveness of care (measured at the NPI level) [u,v]	
Involvement in patient conditions[w]	↑
New problem management[x]	↑

Table 5.C.1 *(continued)*

	Hypothesized direction of impact
Range of services provided by primary care physicians[y]	↑
Other Quality of Care	
Percentage of index acute care hospital discharges that were followed by an unplanned readmission within 30 days[z]	↓
Percentage of index acute care hospital discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days[aa]	↓
Percentage of index ED (including observation stay) discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days[aa]	↓
Hospice service use:	
Percentage of beneficiaries receiving hospice services	↑
Days of hospice use for beneficiaries receiving hospice services in the measurement year[bb]	↑
Days of hospice use for all beneficiaries in the measurement year	↑
Among Medicare FFS beneficiaries ages 65 and older, percentage who received: [cc]	
Two or more prescriptions for high risk medications in the same medication class	↓

Note: For the Medicare expenditures and service utilization measures, services and costs are only counted during months that a beneficiary is enrolled in FFS Parts A and B with Medicare as the primary payer, not enrolled in a health maintenance organization (HMO), and alive. For other measures, such as those for planned care and population health and other quality of care outcomes, we follow the guidelines of the measure stewards and note any deviations from those specifications. In general, for the quality of care outcomes and the continuity of care measures, specific criteria are used to identify beneficiaries eligible for each measure and continuous enrollment in Medicare Parts A and B (also in Part D, for measures based on prescription drug use) is required during the measurement period. We provide details on these restrictions in the description of each measure in the sections below. Comprehensiveness of care measures are defined at the practitioner level.

[a] Expenditures for Part A and Part B services in PY 3 and PY 4 include QPP payment adjustments, based on practitioner performance two years before. They are applicable for both CPC+ and comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims), and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on 2018 and 2019 claims for these practitioners, respectively). For Track 2 practices, Medicare Part A and B expenditures *without* enhanced payments include the base CPCPs, but not the 10 percent comprehensiveness supplement. We include CPCPs in Part B spending because Track 2 practices agreed to lower Part B payment for evaluation and management (E&M) services in exchange for CPCPs.

[b] For Track 2 practices, Medicare Parts A and B expenditures *with* enhanced payments include the base CPCPs, as well as the 10 percent comprehensiveness supplement.

[c] The sum of expenditures by service category does not equal the total expenditures for Part A and Part B services without enhanced payments because the total expenditures include lump sum incentive payments that are not applied at the claim level and are instead paid out directly to eligible practitioners who participated in Advanced APMs in 2017 and 2018.

[d] Acute inpatient care includes short-stay acute hospital admissions and admissions to CAHs.

[e] Expenditures for non-acute hospital admissions other than those for inpatient rehabilitation, such as psychiatric hospital admissions, are included in inpatient expenditures but not shown separately in the report.

[f] Expenditures, with QPP payment adjustments, for outpatient ED visits include professional and facility fees, as well as payments for observation stays. Although these expenditures are shown under outpatient expenditures, they include professional fees, which are part of expenditures for physician and nonphysician Part B noninstitutional services.

[g] Expenditures, with QPP payment adjustments, for Part B noninstitutional services include expenditures for (1) ambulatory primary care visits, (2) ambulatory specialist visits, and (3) non-ambulatory physician visits, as well as services provided by other noninstitutional providers (the third category is not shown separately).

[h] Ambulatory visits are identified as face-to-face or non-face-to-face based on procedure codes, telehealth modifiers, and place of service (carrier file only) on Medicare claims. Visits such as telephone and online assessment and management and E&M are included in the non-face-to-face measure, making it broader than CMS's definition of "telehealth" visits. Within each type of practitioner, the sum of the face-to-face and non-face-to-face visits with primary care practitioners or specialists equals the total ambulatory visits.

[i] We define the assigned practice for the baseline period as the first practice to which a beneficiary was attributed during the baseline period, and the assigned practice for the intervention period as the first practice that the beneficiary was attributed to during the intervention period. Effects on this set of measures are ambiguous because CPC+ could increase the total number of visits as primary care practices offer more comprehensive services and, potentially, extend their office hours. Conversely, CPC+ could decrease in-person office visits by using other non-visit approaches for contacting patients (such as e-visits or secure messaging) or using non-billing care team members to deliver care. We particularly expect shifts to non-visit-based approaches among Track 2

Table 5.C.1 *(continued)*

practices, which are required to offer their patients at least one alternative to traditional office visits, in return for additional non-visit-based revenue in the form of the CPCP (and have their FFS amounts for those E&M services reduced).

[j] Total ED visits include ED/observation stays that led to a hospitalization (including psychiatric hospitalizations).

[k] The sum of primary care substitutable outpatient ED visits and potentially primary care preventable outpatient ED visits is less than total outpatient ED visits because total outpatient ED visits include visits for other care needs, such as injuries, mental health, drug use, and alcohol use.

[l] This measure focuses on ED visits for a subset of injury diagnoses flagged by the NYU algorithm, such as head injuries; most fractures of the facial bones, joints, long bones, or ribs; allergic reactions, toxic exposures, poisoning, and other adverse drug reactions; and surgical and medical device complications.

[m] Ambulatory visits with primary care practitioners and specialists include office-based visits and visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

[n] This measure requires that beneficiaries be continuously enrolled and not have hospice services during the measurement year.

[o] This measure requires that beneficiaries be continuously enrolled during the measurement year as well as the 27 months prior to October 1 of the measurement year and not have hospice services during the measurement year.

[p] This measure requires that beneficiaries be continuously enrolled in Medicare FFS Parts A and B as well as in Medicare Part D, and not use hospice services during the measurement year.

[q] Due to the intent-to-treat (ITT) approach for beneficiary assignment, we expect to see a decrease in visits to practitioners affiliated with the beneficiary's assigned practice over time for both CPC+ and comparison practices. This decline occurs because we continue to assign the beneficiary to the first practice the beneficiary was ever attributed to in the intervention period, regardless of whether the beneficiary continued to receive care at that practice.

[r] The continuity of care measures are calculated for beneficiaries who were in the ITT sample at the beginning of each measurement year, were FFS eligible for the full year, and had qualifying ambulatory visits in that year. Qualifying ambulatory visits are office or other outpatient visits for (1) evaluation and management; (2) ophthalmological services: medical examination and evaluation; and (3) new enrollee and annual wellness visits.

[s] Beneficiaries must have one or more qualifying ambulatory visits to be included in the percentage of visits with the UPC measure.

[t] Beneficiaries must have four or more qualifying ambulatory visits to be included in the rBBI measure.

[u] NPIs are used to define the comprehensiveness of care at the practitioner level.

[v] In the first annual report, we also examined effects of CPC+ on the percentage of beneficiaries who received advance care planning. However, we decided to drop this outcome from all subsequent reports because of concerns that the billing codes for these services were not being regularly reported in Medicare claims.

[w] For each NPI, this measure calculates the percentage of beneficiaries for whom the NPI was considered "most comprehensive" out of all beneficiaries the NPI saw in the year. "Most comprehensive" for this measure means that the NPI saw the patient for the largest share of their unique diagnosis codes.

[x] Creates a score that indicates how often a primary care physician continues to treat a beneficiary's new condition versus referring the beneficiary (or the beneficiary self-referring) to a specialist or different provider.

[y] Creates a score (0–5) that counts the number of service categories for which that primary care practitioner (PCP) billed. The five service categories included in the measure are: immunization, behavioral or mental health counseling, treatment of minor lacerations, cryotherapy/skin excision, and joint injection.

[z] The readmissions outcome is per index discharge.

[aa] There are two different unplanned acute care outcomes, depending on whether the index event was a hospital discharge or an ED discharge. Also, the definition of unplanned acute care is broad and consists of hospitalizations and ED visits, including observation stays.

[bb] Calculated only for beneficiaries who had at least one day of hospice use during the measurement year.

[cc] This measure requires that beneficiaries be continuously enrolled in Medicare Parts A and B as well as in Medicare Part D, and not use hospice services during the measurement year.

ACO = Accountable Care Organization; APM = Alternative Payment Model; CAH = Critical Access Hospital; CMF = care management fee; CPCP = Comprehensive Primary Care Payment; DME = durable medical equipment; ED = emergency department; E&M = evaluation and management; FFS= fee-for-service; FQHC = Federally Qualified Health Center; MIPS = Merit-based Incentive Payment System; NPI = National Provider Identifier; NYU = New York University; PBIP = Performance-based Incentive Payment; PBPM = per beneficiary per month; PCP = primary care practitioner; QPP = Quality Payment Program; SSP = Medicare Shared Savings Program; RHC = Rural Health Clinic; UCC = urgent care center.

Table 5.C.2. Motivation for new CPC+ outcome measures

Outcomes by domain	Why is the outcome important to CPC+?
Medicare expenditure outcomes	
Monthly Medicare expenditures by service category (PBPM)	
Expenditures for ambulatory visits with primary care practitioners Face-to-face visit Non-face-to-face visit Expenditures for ambulatory visits with primary care practitioners *at assigned practice* Face-to-face visit Non-face-to-face visit Expenditures for ambulatory visits with specialists Face-to-face visit Non-face-to-face visit	• To capture potential disruptions in health care use during the COVID-19 pandemic and the increase in telehealth use or non-face-to-face visits, we separately examine expenditures on face-to-face and non-face-to-face ambulatory visits with primary care practitioners and with specialists. We also examine the same face-to-face versus non-face-to-face split for expenditures on ambulatory visits with primary care practitioners at a beneficiary's assigned practice.
Service use outcomes	
Number of ED visits for injuries that are unlikely to be affected by CPC+	• We use this outcome for a falsification test since we do not expect any statistically significant impact of CPC+ on certain types of ED visits for injuries. Examples include laceration of head, concussion with or without loss of consciousness, or fracture of nasal bones. If we do see impacts for these types of visits, it would raise concerns that unobserved differences between the CPC+ and comparison group are driving the impact estimates for the main service use outcomes.
Number of ambulatory primary care visits Face-to-face visit Non-face-to-face visit Number of ambulatory specialist care visits Face-to-face visit Non-face-to-face visit	• To capture potential disruptions in healthcare use during the COVID-19 pandemic and the increase in telehealth use or non-face-to-face visits, we separately examine face-to-face and non-face-to-face ambulatory visits with primary care practitioners and specialists.
Claims-based quality of care outcomes	
Planned care and population health	
Percentage of beneficiaries with cardiovascular disease who were prescribed and filled statin therapy	• To capture changes in the rate of cardiovascular disease patients who received statin therapy; this is a claims-based approximation of an electronic clinical quality measure (eCQM) targeted by CPC+. • This measure tests whether CPC+ led to improvements in population-level receipt of recommended care.
Percentage of beneficiaries on diabetes medications, renin-angiotensin system antagonists, or statins with proportion of days covered by medication > 80% (three rates)	• To capture changes in medication adherence among beneficiaries on diabetes medications, renin-angiotensin system antagonists, or statins. • The three measures test whether CPC+ led to improvements in population-level receipt of recommended care.
Percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed and filled angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) therapy.	• To capture changes in the rate of CAD/diabetes patients who received ACE inhibitors or ARB therapy. • This measure tests whether CPC+ led to improvements in population-level receipt of recommended care.
Continuity of care	
Percentage of primary care ambulatory visits at assigned practices Face-to-face visit Non-face-to-face visit	• To capture potential disruptions in healthcare use during the COVID-19 pandemic and the increase in telehealth use or non-face-to-face visits, we separately examine the share of ambulatory visits with primary care practitioners at a beneficiary's assigned practice for both face-to-face and non-face-to-face visits.

Table 5.C.2 *(continued)*

Outcomes by domain	Why is the outcome important to CPC+?
Across all PCPs and specialists providing care to a patient, where all practitioners in the beneficiary's assigned practice are treated as a single practitioner:	
Percentage of visits with the usual provider of care (UPC)	• Since CPC+ could have expanded visits to care team members at a beneficiary's attributed practice, we created an alternative version of the UPC that gives credit for team-based care at the beneficiary's attributed practice. This measure captures the share of visits with the beneficiary's most frequently seen provider (across all types of practitioners) by counting primary care practitioners in the beneficiary's attributed primary care practice as a single provider.
Reversed Bice-Boxerman Index (rBBI)	• Like above, to give credit for team-based care at the beneficiary's attributed practice, we constructed an alternative measure of a beneficiary's care fragmentation (the inverse of continuity) across all types of practitioners by counting primary care practitioners in the beneficiary's attributed primary care practice as a single provider.
Comprehensiveness of care	
Range of services provided by primary care physicians	• To assess the comprehensiveness of key services that primary care practitioners provided to Medicare fee-for-service beneficiaries instead of referring the patient to another practitioner. These key services address common patient needs, such as minor procedures, immunizations, and routine counseling.
Other Quality of Care	
Percentage of index acute care hospital discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days Percentage of index ED (including observation stay) discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days	• The timely follow-up required by CPC+ care delivery requirements after a hospital discharge and an ED visit, combined with the practices' enhanced resources and primary care capabilities, should help CPC+ practices to manage hospital- or ED-to-home transitions better than comparison practices. CPC+ patients are therefore expected to have a lower rate of use of unplanned acute care services—ED visits, observation stays, and hospital readmissions—in the 30 days after an acute care hospitalization or after an ED visit or observation stay. • Because unplanned acute care events are, by definition, at least as frequent as hospital readmissions, we expect the two measures to yield greater statistical power than the current 30-day readmission measure.
Two or more prescriptions for high-risk medications in the same medication class	• Claims-based approximation of an electronic clinical quality measure (eCQM) targeted by CPC+ • Measure tests whether CPC+ led to a reduction in receipt of high-risk medication by Medicare beneficiaries

CAH = Critical Access Hospital; ED = emergency department; FFS= fee-for-service; NPI = National Provider Identifier; PCP = primary care practitioners.

A. Medicare expenditures

In this section, we describe the expenditure outcomes we examined in the impact analysis. First, we present expenditure measures for Medicare Parts A and B, then we discuss Medicare expenditures by service category.

A.1. Medicare expenditures for Part A and Part B services

CMS theorized that changes in care delivery made by CPC+ practices would ultimately result in a reduction in overall Medicare expenditures great enough to offset CMS's enhanced payments. Therefore, we analyzed Medicare expenditures for fee-for-service (FFS) beneficiaries with and without CMS's enhanced payments. All Medicare expenditures exclude third-party and beneficiary liability payments. We provide detailed descriptions for the three Medicare Part A

and Part B expenditures measures below. But first we describe the adjustments included in expenditures without enhanced payments and also what counts as enhanced payments.

Medicare expenditures without enhanced payments include Medicare Part A and Part B payments as well as Quality Payment Program (QPP) payments. Starting in 2019, QPP payments include claims-based adjustments for the Merit-based Incentive Payment System (MIPS) that are negative or positive adjustments to physician fees and Critical Access Hospital (CAH) claims and Advanced Alternative Payment Model (APM) incentive payments based on 2017 and 2018 performance. The MIPS adjustments are included in the payment amount in the 2019 and 2020 Medicare claims, for performance in 2017 and 2018, respectively. APM incentive payments are NPI-level payments paid directly to eligible practitioners. We use an NPI-level payment file we received from CMS and a list of NPIs affiliated with each practice. We used random assignment to assign NPIs working at multiple practices to a unique practice and aggregated the NPI level payments to the practice level.[56] For Track 2 practices, CMS also provided alternative payments, in the form of CPCPs, which shifted a portion of the payments practices receive for services from FFS to prospective payments. As these are payments *for services*, they are included in the Medicare expenditure measures without enhanced payments.

Enhanced payments are made *in addition to traditional payments for services and the QPP payments described in the previous paragraph.* As our goal is to estimate impacts for Medicare expenditures for FFS beneficiaries, we do not include enhanced payments from other (non-Medicare) payers in our calculations. Medicare enhanced payments include CMS's CPC+ care management fees (CMFs) for Medicare FFS beneficiaries as well as CMS's payments for rewarding performance. Payments for rewarding performance are: (1) a comprehensiveness supplement for practices participating in Track 2, which is equal to 10 percent of their share of payments (for services) that are made prospectively; (2) prospectively paid and retrospectively reconciled Performance-based Incentive Payments (PBIPs) for practices not participating in the Medicare Shared Savings Program (SSP); and (3) shared savings payments to Accountable Care Organizations (ACOs) for practices participating in SSP.

As described below, the three measures of Medicare Part A and Part B expenditures **that we include in our impact analysis are**: (1) expenditures without enhanced payments; (2) expenditures that include CMFs and the comprehensiveness supplement; and (3) expenditures that include the CMFs, the comprehensiveness supplement, PBIPs, and shared savings payments.

Medicare expenditures for all Part A and Part B services, without enhanced payments, in dollars per beneficiary per month.[57] This measure reflects Medicare expenditures for Part A and Part B covered services during the baseline or intervention period. It includes Medicare payments for inpatient, outpatient, and physician and non-physician services, as well as skilled nursing facilities (SNFs), home health, hospice services, and durable medical equipment (DME) services. Medicare Parts A and B expenditures also include QPP payments and exclude third-

[56] In the third annual report, the proportion of NPIs that worked at multiple practices was5.2 percent and accounted for 6.5 percent of APM incentive payments.

[57] We do not include Part D expenditures, because Medicare makes prospective payments to Part D prescription drug plans that are not directly related to each individual prescription filled by a beneficiary. That is, changes in beneficiaries' prescription use do not affect their PBPM Medicare expenditures.

party and beneficiary liability payments. The sum of expenditures by service category does not equal the total expenditures for traditional services without enhanced payments, because the total expenditures include lump-sum incentive payments that are not applied at the claim level and instead paid out directly to eligible practitioners who participated in Advanced APMs in 2017 and 2018.

To obtain the per beneficiary per month (PBPM) amount, we summed Part A and Part B payments for the months a beneficiary was eligible for Medicare FFS during the year and then divided the payments by the number of months the beneficiary was eligible for Medicare FFS. For Track 2 practices, we also included the base CPCPs (but not the 10 percent comprehensiveness supplement). We calculated this PBPM for Track 2 by dividing the total CPCPs to a practice during the reporting period, minus any adjustments or debits (due to retrospective changes in Medicare FFS eligibility of attributed beneficiaries or duplicative billing of services) or recoupments due to early withdrawal from the model, by the total number of Medicare FFS eligible beneficiary-months among beneficiaries assigned to that practice during the period.

Medicare expenditures for all Part A and Part B services, including the CMFs and the comprehensiveness supplement, in dollars PBPM. We added the following payments to the expenditures measure (in dollars PBPM):

- The net care management fees (after accounting for debits and recoupments)[58]
- The 10 percent comprehensiveness supplement, for Track 2 practices only

Starting in PY 1 (2017), CPC+ practices in both tracks received CMFs from CMS, in addition to usual payments for services, to support their participation in CPC+. CMFs are paid to practices at regular intervals—most commonly at the beginning of each quarter or month—for each patient a payer partner attributes to a practice.

Medicare expenditures for all services, including the CMFs, the comprehensiveness supplement, PBIPs, and SSP payments, in dollars PBPM. We added enhanced payments to the expenditures measure directly above. Specifically, we added the following:

- The final, reconciled PBIP (after recoupments for not meeting quality or utilization targets) for the year received by non-SSP practices

[58] CMS paid practices in Track 1 and Track 2 average CMFs of $15 and $28, respectively, per month per attributed CPC+ beneficiary in Medicare FFS. These fees were higher than the average fees per month across all intervention years (2017-2020) received of $12 and $24 PBPM for Track 1 and Track 2 practices, respectively, in our analysis sample, because (1) our ITT sample follows beneficiaries even after they are no longer attributed to a CPC+ practice and therefore the practice is no longer receiving CMFs for the Medicare FFS beneficiary, and (2) the list of practitioners and the attribution approach we use for the evaluation are slightly different from those CMS uses for payment. This slight discrepancy between average CMS payments and average payments in our ITT sample applies to PBIPs as well as Track 2 CPCPs. Therefore, all our calculated PBPM payment amounts (for CMFs and PBIPs in both tracks, and for CPCPs in Track 2) for the analysis sample are lower than the CMS-reported numbers for the intervention sample.

- The shared savings payments earned by their SSP ACO for the SSP practices

For each practice, we divided the CMFs, the 10 percent comprehensiveness supplement, and the PBIPs by the total number of Medicare FFS eligible beneficiary-months in the practice during the reporting period to get the PBPM amounts. There were three steps for adjusting Medicare expenditures for SSP ACO payments. First, we identified the beneficiaries in our sample that were part of an SSP ACO (as determined by the beneficiary level participation data available through MDM). Next, we divided the total shared savings payments earned by their SSP ACO during the reporting period by the total number of Medicare FFS eligible beneficiary-months in that ACO during the period to get a PBPM amount. Lastly, we added this PBPM amount to the average monthly expenditure calculated for these beneficiaries. For example, if an ACO received $500,000 in shared savings and had 50,000 Medicare FFS beneficiary months associated with it for that year (e.g., 5,000 beneficiaries with an average of 10 months of Medicare FFS coverage leading to 50,000 beneficiary months), then we first calculated the PBPM amount of shared savings as $10 PBPM. If only 500 of those beneficiaries in the ACO were also attributed to a CPC+ or comparison practice, then for each of those 500 beneficiaries in our analysis sample, we added $10 PBPM to their claims-based PBPM Medicare expenditures amount for that year.

A.2. Medicare expenditures by service category

In addition to analyzing total expenditures, we also report Medicare expenditures for specific services. We exclude enhanced CPC+ payments when examining measures for each service category. However, MIPS adjustments are included in both Part B expenditures and CAH expenditures that are part of the outpatient expenditures, and CPCPs are included in the Part B expenditures. We create measures for Medicare expenditures stratified by type of Part A or Part B service for the service categories below:

- Inpatient facility expenditures include Part A payments for both acute and non-acute hospitalizations. Short-stay, or acute care hospitalizations and CAH claims, are the most frequent (more than 90 percent of the inpatient claims). Non-acute hospitalizations are primarily at psychiatric or rehabilitation hospitals or units.
- Outpatient facility Part A payments include, but are not limited to, hospital outpatient departments (including emergency rooms), Rural Health Clinics (RHCs) and Federally Qualified Health Centers (FQHCs), renal dialysis facilities, outpatient rehabilitation facilities, comprehensive outpatient rehabilitation facilities, and community mental health centers.
- Part B expenditures for services provided by physicians or non-physicians are expenditures for services provided by professional providers, including physicians, physician assistants (PAs), clinical social workers, nurse practitioners (NPs), and clinical nurse specialists (CNSs). Part B expenditures also include some organizational providers, such as freestanding facilities. Examples of these organizational providers include independent clinical laboratories, ambulance providers, freestanding ambulatory surgical centers, and freestanding radiology centers.
- Home health expenditures include both Part A and Part B expenditures paid to Medicare home health agency providers.

- Skilled nursing facility expenditures include Medicare Part A payments for inpatient stays for nursing care, rehabilitation, and other related health services for patients who need nursing care but do not require hospitalization.
- Hospice expenditures are Part A payments to Medicare certified hospices providers.
- Durable medical equipment expenditures include both Part A and Part B Medicare payments for Medicare-covered equipment. DME prescribed by a primary care practitioner is covered by Part B, while DME received during a SNF or hospital inpatient stay is paid through Medicare Part A.

In addition, we created a few specific expenditure categories within these broad service categories above for services, such as acute inpatient, inpatient rehabilitation facilities, outpatient emergency department, and ambulatory visits with primary care practitioners and specialists. We describe these more granular expenditure outcomes below.

Acute hospitalization expenditures. We created two subset outcomes of inpatient expenditures. The first is short-stay acute inpatient/CAH expenditures. We categorized an inpatient stay as a short-stay acute inpatient hospital stay when the third through sixth digits of the provider number are equal to 0001 through 0899. If the third and fourth digits of the provider number are equal to 13, then it is a CAH stay.

Inpatient rehabilitation facility expenditures. The second subset of inpatient expenditures is Medicare payments for inpatient rehabilitation facilities (IRFs). IRF claims are identified using the provider number values 3025 through 3099 in the third through sixth digit or if there is a value of R or T in the third position. Note that IRF expenditures are a subset of the non-acute hospitalization component of total inpatient expenditures. The remaining expenditures for other non-acute facilities are not reported separately.

Outpatient ED (including observation stays) expenditures. We created an outpatient facility and professional expenditures measure for emergency department (ED) claims that is a subset of total hospital outpatient department expenditures. To identify outpatient ED visits for this expenditure measure, we use the approach described in the service utilization section below, with one exception: expenditures are not restricted to one ED stay per day, to ensure we include all expenditures associated with these services. We used a two-step process to identify professional expenditures associated with outpatient facility ED claims. First, we identified professional claims with a place of service code equal to 2, which indicates ED or an evaluation and management service provided in the ED (CPT code equal to 99281-99285) or during an observation stay (CPT code equal to 99217-99220 or 99224-99226). Next, we linked these professional claims to outpatient facility ED claims and retained professional claims with dates of service overlapping or one day before or after the dates of service in an outpatient facility ED claim for the same beneficiary.

Medicare expenditures for ambulatory visits. We also identified expenditures for ambulatory visits using carrier claims and FQHC, RHC, and CAH claims from the outpatient file. Note that visits associated with the carrier file do not include potential facility fees. We created two categories of ambulatory visit expenditures: (1) ambulatory visits with primary care practitioners and (2) ambulatory visits with specialists. Note that in the third annual report we made additions

to the specialty categories to maintain consistency with other outcomes such as comprehensiveness and fragmentation of care that use specialty designations; we did not make any further modifications in this report. For ambulatory services provided by primary care practitioners, we further calculated expenditures for services provided by primary care practitioners at the beneficiary's assigned practice versus at other practices. All ambulatory visit expenditures measures are also reported by whether the visit was face-to-face or non-face-to-face (includes telephone, online via a secure platform, or other audio or video connection). See Section B.4 for more details on face-to-face versus non-face-to-face ambulatory physician visits.

B. Service use

We evaluated impacts on a range of service use outcomes for Medicare FFS beneficiaries, so that CMS might consider the patterns of effects across these domains along with any observed impacts on Medicare expenditures without and with CMS's enhanced payments. These selected measures of Medicare service use include the number of acute hospitalizations, ED visits, urgent care center (UCC) visits, ambulatory visits, and other service use, such as 30-day unplanned readmissions.

B.1. Acute hospitalizations

Number of hospitalizations at short-stay acute hospitals and CAHs per 1,000 beneficiaries per year. This measure is the annualized hospitalization rate per 1,000 beneficiaries of all short-stay acute hospital and CAH admissions. Transfers between acute/CAH facilities are counted as a single admission. Multiple claims for acute admissions from traditional acute care hospitals and CAHs that represent transfers between hospitals are combined into a single record, so that they count as one admission.

B.2. ED visits

Number of ED visits per 1,000 beneficiaries per year. We created an overall ED visit measure that combines ED visits leading to a hospitalization with outpatient ED visits (and observation stays). Note that an observation stay, by definition, does not always lead to an inpatient admission. In addition, we reported the outpatient ED visits separately. We describe the methodology for identifying the two components of this measure below.

ED visits that lead to a hospitalization are identified in the inpatient file and include acute, critical access, or psychiatric hospital stays that have a claim with a revenue center line item equal to 045X or 0981 (emergency room care) or 0762 (treatment or observation room). These visits are not shown separately.

Outpatient ED visits are identified in the outpatient department file using revenue center line items equal to 045X or 0981 (emergency room care), 0762 (treatment or observation room), or 0760 (treatment or observation room—general classification). We counted a visit as an observation stay if it was longer than eight hours and had a corresponding Health Care Common Procedure Coding System (HCPCS) code of G0378 (hospital observation services per hour). If the procedure code on the line item of the ED claim was equal to 70000 through 79999 or 80000 through 89999, we excluded it; this exclusion was intended to exclude claims in which only

radiological or pathology/laboratory services were provided. We then capped the number of ED visits to one per day.

Outpatient ED visits, including observation stays, per 1,000 beneficiaries per year. In addition to the total ED visit measure, we also examined outpatient ED utilization separately. This measure is the annualized number of emergency room visits and observation stays (combined to create ED visits) that do not lead to a hospitalization, per 1,000 beneficiaries.

Primary care substitutable ED visits, potentially primary care preventable outpatient ED visits, and ED visits for injuries that are unlikely to be affected by CPC+—each calculated per 1,000 beneficiaries per year. These measures are subsets of the outpatient ED visits identified above. The construction of the first two measures aligns with the New York University Emergency Department Algorithm (NYU EDA), the measure most commonly used to identify primary care treatable ED visits. To this algorithm, we applied the "patch" developed by Johnston et al. (2017)
2001. This algorithm assigns all ED visits identified for the outpatient ED visit measure above the probability of the visit being in each of the following categories: (1) nonemergent; (2) emergent but treatable in a primary care setting; (3) emergent/ED care required but preventable or avoidable if appropriate ambulatory care had been received; and (4) emergent/ED care required and not preventable or avoidable. If there are multiple ED claims with the same from date, we keep only the first claim to appear in the file.

- The probability of a visit being primary care substitutable is calculated as the sum of the probabilities that the visit is nonemergent or emergent but treatable in a primary care setting (NYU Categories 1 and 2).

- The probability of a visit being potentially primary care preventable is based on NYU Category 3, emergent/ED care required but preventable or avoidable if appropriate ambulatory care had been received.

We summed these probabilities across all ED visits to estimate the total number of primary care substitutable ED visits and the total number of potentially primary care preventable ED visits.

To construct the number of ED visits for injuries unlikely to be affected by CPC+, we first identified the 200 most frequently billed injury diagnosis codes within the NYU EDA injury category for 2016 through 2019. These 200 diagnoses accounted for about 70 percent of all ED injury visits over the period. Because we are planning to use this measure as a falsification test, our team of clinical experts reviewed each diagnosis and identified those that are unlikely to be affected by CPC+, either through changes in primary care access or prevention (Table 5.C.3). We expect there to be no statistically significant impact of CPC+ on these types of ED visits; if there is an effect, it would suggest that there could be unobserved differences between our treatment and comparison groups.

Table 5.C.3. Diagnosis codes for injuries unlikely to be affected by CPC+

ICD-10 Codes	Description
I952	Hypotension due to drugs[a]
K91840	Postproc hemor of a dgstv sys org fol a dgstv sys procedure
L7621	Postproc hemor of skin, subcu fol a dermatologic procedure
L7622	Postproc hemorrhage of skin, subcu following other procedure
S0001XA	Abrasion of scalp, initial encounter
S0003XA	Contusion of scalp, initial encounter
S0031XA	Abrasion of nose, initial encounter
S0081XA	Abrasion of other part of head, initial encounter
S0083XA	Contusion of other part of head, initial encounter
S0093XA	Contusion of unspecified part of head, initial encounter
S0101XA	Laceration without foreign body of scalp, initial encounter
S01111A	Laceration w/o fb of right eyelid and periocular area, init
S01112A	Laceration w/o fb of left eyelid and periocular area, init
S0121XA	Laceration without foreign body of nose, initial encounter
S01311A	Laceration without foreign body of right ear, init encntr
S01312A	Laceration without foreign body of left ear, init encntr
S01511A	Laceration without foreign body of lip, initial encounter
S01512A	Laceration without foreign body of oral cavity, init encntr
S0181XA	Laceration w/o foreign body of oth part of head, init encntr
S0191XA	Laceration w/o foreign body of unsp part of head, init
S022XXA	Fracture of nasal bones, init encntr for closed fracture
S0511XA	Contusion of eyeball and orbital tissues, right eye, init
S0512XA	Contusion of eyeball and orbital tissues, left eye, init
S060X0A	Concussion without loss of consciousness, initial encounter
S060X1A	Concussion w LOC of 30 minutes or less, init
S060X9A	Concussion w loss of consciousness of unsp duration, init
S065X0A	Traum subdr hem w/o loss of consciousness, init
S065X9A	Traum subdr hem w LOC of unsp duration, init
S066X0A	Traum subrac hem w/o loss of consciousness, init
S069X9A	Unsp intracranial injury w LOC of unsp duration, init
S098XXA	Other specified injuries of head, initial encounter
S0990XA	Unspecified injury of head, initial encounter
S0993XA	Unspecified injury of face, initial encounter
S139XXA	Sprain of joints and ligaments of unsp parts of neck, init
S22080A	Wedge compression fracture of T11-T12 vertebra, init
S22089A	Unsp fracture of T11-T12 vertebra, init for clos fx
S2231XA	Fracture of one rib, right side, init for clos fx
S2232XA	Fracture of one rib, left side, init for clos fx
S2241XA	Multiple fractures of ribs, right side, init for clos fx
S2242XA	Multiple fractures of ribs, left side, init for clos fx
S32010A	Wedge compression fracture of first lumbar vertebra, init
S32019A	Unsp fracture of first lumbar vertebra, init for clos fx
S3210XA	Unsp fracture of sacrum, init encntr for closed fracture
S32591A	Oth fracture of right pubis, init encntr for closed fracture
S32592A	Oth fracture of left pubis, init encntr for closed fracture
S39012A	Strain of muscle, fascia and tendon of lower back, init
S42201A	Unsp fracture of upper end of right humerus, init
S42202A	Unsp fracture of upper end of left humerus, init for clos fx
S42211A	Unsp disp fx of surgical neck of right humerus, init
S42212A	Unsp disp fx of surgical neck of left humerus, init

Table 5.C.3 *(continued)*

ICD-10 Codes	Description
S42291A	Oth disp fx of upper end of right humerus, init for clos fx
S42292A	Oth disp fx of upper end of left humerus, init for clos fx
S43005A	Unspecified dislocation of left shoulder joint, init encntr
S5001XA	Contusion of right elbow, initial encounter
S50312A	Abrasion of left elbow, initial encounter
S50811A	Abrasion of right forearm, initial encounter
S50812A	Abrasion of left forearm, initial encounter
S51812A	Laceration without foreign body of left forearm, init encntr
S52501A	Unsp fracture of the lower end of right radius, init
S52502A	Unsp fracture of the lower end of left radius, init
S52531A	Colles' fracture of right radius, init for clos fx
S52532A	Colles' fracture of left radius, init for clos fx
S52571A	Oth intartic fracture of lower end of right radius, init
S52572A	Oth intartic fracture of lower end of left radius, init
S52591A	Oth fractures of lower end of right radius, init for clos fx
S52592A	Oth fractures of lower end of left radius, init for clos fx
S61012A	Laceration w/o fb of left thumb w/o damage to nail, init
S61211A	Laceration w/o fb of l idx fngr w/o damage to nail, init
S61212A	Laceration w/o fb of r mid finger w/o damage to nail, init
S61217A	Lac w/o fb of l little finger w/o damage to nail, init
S61411A	Laceration without foreign body of right hand, init encntr
S61451A	Open bite of right hand, initial encounter
S61452A	Open bite of left hand, initial encounter
S7001XA	Contusion of right hip, initial encounter
S0012XA	Contusion of left eyelid and periocular area, init encntr
S7002XA	Contusion of left hip, initial encounter
S72001A	Fracture of unsp part of neck of right femur, init
S72002A	Fracture of unsp part of neck of left femur, init
S8001XA	Contusion of right knee, initial encounter
S8002XA	Contusion of left knee, initial encounter
S8011XA	Contusion of right lower leg, initial encounter
S8012XA	Contusion of left lower leg, initial encounter
S43004A	Unspecified dislocation of right shoulder joint, init encntr
S80211A	Abrasion, right knee, initial encounter
S80212A	Abrasion, left knee, initial encounter
S80812A	Abrasion, left lower leg, initial encounter
S81011A	Laceration without foreign body, right knee, init encntr
S0011XA	Contusion of right eyelid and periocular area, init encntr
S81801A	Unspecified open wound, right lower leg, initial encounter
S81802A	Unspecified open wound, left lower leg, initial encounter
S0033XA	Contusion of nose, initial encounter
S82831A	Oth fracture of upper and lower end of right fibula, init
S82832A	Oth fracture of upper and lower end of left fibula, init
S92351A	Disp fx of fifth metatarsal bone, right foot, init
S92352A	Disp fx of fifth metatarsal bone, left foot, init
T8130XA	Disruption of wound, unspecified, initial encounter
T18128A	Food in esophagus causing other injury, initial encounter
T383X1A	Poisoning by insulin and oral hypoglycemic drugs, acc, init
T401X1A	Poisoning by heroin, accidental (unintentional), init encntr
T402X1A	Poisoning by oth opioids, accidental (unintentional), init
T50901A	Poisoning by unsp drug/meds/biol subst, accidental, init

Table 5.C.3 ***(continued)***

ICD-10 Codes	Description
T50905A	Adverse effect of unsp drug/meds/biol subst, init
T63441A	Toxic effect of venom of bees, accidental, init
T63461A	Toxic effect of venom of wasps, accidental, init
T781XXA	Oth adverse food reactions, not elsewhere classified, init
T783XXA	Angioneurotic edema, initial encounter
T7840XA	Allergy, unspecified, initial encounter
T8131XA	Disruption of external operation (surgical) wound, NEC, init
T83028A	Displacement of other urinary catheter, initial encounter
T8189XA	Oth complications of procedures, NEC, init
T82838A	Hemorrhage due to vascular prosth dev/grft, init
T82868A	Thrombosis due to vascular prosth dev/grft, init
T82898A	Oth complication of vascular prosth dev/grft, init
T83018A	Breakdown (mechanical) of other urinary catheter, init
T83038A	Leakage of other urinary catheter, initial encounter
T83098A	Mech compl of other urinary catheter, initial encounter
T839XXA	Unsp complication of genitourinary prosth dev/grft, init
S43014A	Anterior dislocation of right humerus, initial encounter
T84020A	Dislocation of internal right hip prosthesis, init encntr
T84021A	Dislocation of internal left hip prosthesis, init encntr

Sources: These codes were identified by our team of clinical experts who reviewed the 200 most commonly billed diagnosis codes during 2016 through 2019 reported within the NYU EDA injury category, after applying the "patch" developed by Johnston et al. (2017). They identified a subset of the 200 codes as being unlikely to be affected by CPC+.

[a] This diagnosis, hypotension due to drugs, is included in the category of diagnoses related to adverse drug reactions that are considered unlikely to be affected by CPC+. These include allergic reactions, toxic exposures, poisoning (including accidental poisoning by opioids), and other adverse drug reactions. When these clinical conditions occur, they likely require monitoring and availability of treatments to reverse or mitigate effects of drugs or toxins that are not available in a primary care setting. Additionally, these diagnoses are unlikely to be meaningfully prevented through changes to primary care delivery. Excluding this diagnosis from the set of codes used to define injuries that are unlikely to be affected by CPC+ has a very small effect on the measure.

B.3. Urgent care center visits

Total urgent care center (UCC) visits per 1,000 beneficiaries per year. This measure includes UCC visits identified in the carrier claims file based on a place of service equal to 20 and outpatient hospital file services with a revenue code of 516 or 526. If there are multiple UCC visits with the same initial date of service, we counted only the first UCC claim to appear in the file.

Primary care substitutable UCC visits per 1,000 beneficiaries per year. Like the parallel ED visit measure described above, the construction of this measure aligns with the NYU EDA. To the NYU EDA, we applied the "patch" developed by Johnston et al. (2017). We used this algorithm to assign all UCC visits identified for the total UCC visit count measure above the probability of the visit being in each of the following categories: (1) nonemergent; (2) emergent but treatable in a primary care setting; (3) emergent/ED care required but preventable or avoidable if appropriate ambulatory care had been received; and (4) emergent/ED care required and not preventable or avoidable. If there are multiple UCC claims with the same from date, we keep only the first claim to appear in the file. We calculated the probability of a UCC visit being primary care substitutable by summing the probabilities that the visit is in the nonemergent or

emergent but treatable in a primary care setting categories. We summed these probabilities across all UCC visits to estimate the total number of primary care substitutable UCC visits.

B.4. Ambulatory visits, including visits to FQHCs, RHCs, and CAHs

We created two measures of the number of ambulatory visits: annualized visits per 1,000 beneficiaries to (1) primary care practitioners and (2) specialists. Specialties were grouped into primary care practitioners and specialists as defined by Healthcare Provider Taxonomy Codes reported in the National Plan and Provider Enumeration System (NPPES) (taxonomy codes are listed in Table 5.C.4 for primary care practitioners and in Table 5.C.5 for specialists). Multiple claims with the same practitioner on the same day are counted as one visit, and multiple claims with different practitioners on the same day are counted as separate visits. We discuss the criteria for identifying ambulatory visits and updates to the methodology since our second annual report below:

- To identify a practitioners' specialty, we use only the primary taxonomy code from the NPPES, rather than both the primary and secondary taxonomy codes (a change implemented in the second annual report).
- In the third annual report, we identified new specialties for primary care practitioners and specialists to ensure consistency across measures that use specialty designations. The specialty designations are now the same across the measures of ambulatory visits, continuity/fragmentation of care, and comprehensiveness of care (see Appendix 5.B in Orzol et al. [2021] for details). There were no changes to specialty designations for this report.
- For this report, we expanded our definition of ambulatory visits to align with the narrow definition of primary care services that others have used to measure primary care spending in both the Medicare and the commercially insured populations (Bailit et al. 2017; Reid et al. 2019; Kempski and Greiner 2020). This definition includes procedure codes for professional claims, including evaluation and management visits, preventive visits, care transition or coordination services, and in-office preventive services, screening, and counseling. Table 5.C.6 provides a complete list of visits for office-based evaluation and management, nursing home and home care, care management services (including behavioral health), health and behavior assessments, psychotherapy, and other services mentioned above—as defined by HCPCS/Current Procedural Terminology (CPT) and revenue center codes. Table 5.C.7 explains the codes.
- Add-on services are counted in the expenditures but not in utilization measures as a separate service (creating a more precise count of actual ambulatory visits). For example, CPT code 99354 is for prolonged physician services in an office or outpatient setting billed on the same day as the companion evaluation and management codes (e.g., office or other outpatient E&M visits). See the Ambulatory Visit Indicator column in Table 5.C.7 for the complete list of visits identified as "add-on" services.
- Certain services qualify only if they have a non-inpatient place of service to limit to services in ambulatory settings only (primarily, newly added behavioral health services). Table 5.C.7 identifies procedure codes subject to these additional criteria in the Place of Service Indicator column.

- Ambulatory visits on the outpatient file are included only if they were provided at an FQHC, RHC, or CAH, to avoid double-counting services that would appear in the physician bills on the carrier file.
- The CPT Editorial Panel instituted several procedure code updates during our analytic time period. Therefore, we updated our specifications to reflect codes as they were added, deleted, or replaced. We included new procedure codes as they were implemented or updated them when they were replaced. These changes are tracked in Table 5.C.8.

Number of ambulatory visits to primary care practitioners (including visits to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year. This measure is the number of annualized ambulatory visits per 1,000 beneficiaries to primary care practitioners, including NPs, CNSs, and PAs. Table 5.C.4 lists primary care-specific taxonomy codes. Codes for ambulatory visits are listed in Table 5.C.6 and explained in Table 5.C.7.

Number of ambulatory visits to specialists (including visits to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year. This measure is the number of annualized ambulatory visits per 1,000 beneficiaries to specialists, including surgeons, psychiatrists, and emergency medicine practitioners. Table 5.C.5 lists specialty taxonomy codes. New additions to the specialist list (noted above) align this measure with the fragmentation of care work. We exclude non-specialist taxonomies, such as laboratories, ambulance, chiropractor, and physical therapy. To identify the number of specialist ambulatory visits, we use the same criteria we use to identify ambulatory visits to primary care practitioners. Codes for ambulatory visits are listed in Table 5.C.6 and explained in Table 5.C.7.

Number of non-face-to-face ambulatory visits to primary care or specialist practitioners (including visits to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year. We identified a subset of ambulatory visits as non-face-to-face using three selection criteria. All remaining ambulatory visits are considered face-to-face encounters. Non-face-to-face ambulatory visits are:

1. Ambulatory visit procedure codes such as telephone and online E&M; telephone and online assessment and management; chronic care remote patient monitoring; and virtual check-ins. These codes are in green shaded rows for easy identification in Table 5.C.7.
2. Ambulatory visits with a modifier value of 95, GT, GQ, or G0 indicating a telehealth visit.
3. Ambulatory visits identified on the carrier file that have the place of service equal to 02 (telehealth).

Table 5.C.4. Primary care taxonomy codes

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
Physician/Family Practice	207Q00000X	Physicians/Family Medicine
	207QA0000X	Physicians/Family Medicine, Adolescent Medicine**
	207QA0505X	Physicians/Family Medicine, Adult Medicine
	207QG0300X	Physicians/Family Medicine, Geriatric Medicine
Physician/Internal Medicine	207R00000X	Physicians/Internal Medicine
	207RA0000X	Physicians/Internal Medicine, Adolescent Medicine**
	207RG0300X	Physicians/Internal Medicine, Geriatric Medicine
Physician/Pediatrics[a]	208000000X	Physicians/Pediatrics**
	2080A0000X	Physicians/Pediatrics, Adolescent Medicine**
	2080P0006X	Physicians/Pediatrics, Developmental/Behavioral Pediatrics***
	2080P0008X	Physicians/Pediatrics, Neurodevelopmental Disabilities***
	2083B0002X	Physicians/Pediatrics, Preventative Medicine***
Nurse Practitioner	363L00000X	Nurse Practitioner
	363LA2100X	Nurse Practitioner, Acute Care
	363LA2200X	Nurse Practitioner, Adult Health
	363LC1500X	Nurse Practitioner, Community Health
	363LF0000X	Nurse Practitioner, Family
	363LG0600X	Nurse Practitioner, Gerontology
	363LP0200X	Nurse Practitioner, Pediatrics**
	363LP2300X	Nurse Practitioner, Primary Care
	363LW0102X	Nurse Practitioner, Women's Health
Certified Clinical Nurse Specialist	364S00000X	Clinical Nurse Specialist
	364SA2100X	Clinical Nurse Specialist, Acute Care
	364SA2200X	Clinical Nurse Specialist, Adult Health
	364SC1501X	Clinical Nurse Specialist, Community Health/Public Health
	364SC2300X	Clinical Nurse Specialist, Chronic Care
	364SF0001X	Clinical Nurse Specialist, Family Health
	364SG0600X	Clinical Nurse Specialist, Gerontology
	364SH1100X	Clinical Nurse Specialist, Holistic
	364SP0200X	Clinical Nurse Specialist, Pediatrics**
	364SW0102X	Clinical Nurse Specialist, Women's Health
Physician Assistant	363A00000X	Physician Assistant
	363AM0700X	Physician Assistant, Medical
Physician/Undefined Physician Type	208D00000X	General Practice
	2083P0901X	General Practice, Public Health & General Preventive Medicine***
Federally Qualified Health Center	261QF0400X	Ambulatory Health Care Facilities/FQHC
Rural Health Clinic	261QR1300X	Ambulatory Health Care Facilities/Clinic Center, Rural Health

Source: Centers for Medicare & Medicaid Services. "Crosswalk Medicare Provider/Supplier to Healthcare Provider Taxonomy." Baltimore, MD: CMS. Available at https://data.cms.gov/Medicare-Enrollment/CROSSWALK-MEDICARE-PROVIDER-SUPPLIER-to-HEALTHCARE/j75i-rw8y. Accessed May 8, 2020.

Notes: Descriptions annotated with two asterisks (**) are categories added since our first annual report; three asterisks (***) indicate categories that have been added since our second annual report. To ensure consistency across measures that use specialty designations, we identified new specialties for primary care practitioners in our second and third annual reports. The specialty designations remain the same across the measures of ambulatory visits, continuity/fragmentation of care, and comprehensiveness of care measures. Taxonomy code 207QH0002X (Hospice and Palliative Medicine) was removed and added to specialist care in the second annual report.

[a] This Physician/Pediatrics specialty is more relevant for analyses of the Medicaid population, but it will also capture some beneficiaries in the Medicare population.

Table 5.C.5. Specialist care taxonomy codes

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
Surgery	208600000X	Physicians/Surgery
	2086S0120X	Physicians/Surgery/Pediatric Surgery
	2086S0122X	Physicians/Surgery/Plastic and Reconstructive Surgery
	2086S0105X	Physicians/Surgery/Surgery of the Hand
	2086S0102X	Physicians/Surgery/Surgical Critical Care
	2086X0206X	Physicians/Surgery/Surgical Oncology
	2086S0127X	Physicians/Surgery/Trauma Surgery
	2086S0129X	Physicians/Surgery/Vascular Surgery
	208G00000X	Physicians/Thoracic
	204F00000X	Physicians/Transplant Surgery
	208C00000X	Physicians/Colon & Rectal Surgery
	207T00000X	Physicians/Neurological Surgery
	204E00000X	Physicians/Oral & Maxillofacial Surgery
	207X00000X	Physicians/Orthopedic Surgery
	207XS0114X	Physicians/Orthopedic Surgery/Adult Reconstructive Orthopedic Surgery
	207XX0004X	Physicians/Orthopedic Surgery/Foot and Ankle Surgery
	207XS0106X	Physicians/Orthopedic Surgery/Hand Surgery
	207XS0117X	Physicians/Orthopedic Surgery/Orthopedic Surgery of the Spine
	207XX0801X	Physicians/Orthopedic Surgery/Orthopedic Trauma
	207XP3100X	Physicians/Orthopedic Surgery/Pediatric Orthopedic Surgery
	207XX0005X	Physicians/Orthopedic Surgery/Sports Medicine
	208200000X	Physicians/Plastic Surgery
	2082S0099X	Physicians/Plastic Surgery/Plastic Surgery Within the Head & Neck
	2082S0105X	Physicians/Plastic Surgery/Surgery of the Hand
	2086H0002X	Physicians/Surgery/Hospice and Palliative Medicine***
Allergy/Immunology/ Otolaryngology	207K00000X	Physicians/Allergy and Immunology
	207KA0200X	Physicians/Allergy and Immunology/Allergy
	207KI0005X	Physician/Allergy and Immunology/Allergist***
	207Y00000X	Physicians/Otolaryngology
	207YS0123X	Physicians/Otolaryngology/Facial Plastic Surgery
	207YX0602X	Physicians/Otolaryngology/Otolaryngic Allergy
	207YX0905X	Physicians/Otolaryngology/Otolaryngology/Facial Plastic Surgery
	207YX0901X	Physicians/Otolaryngology/Otology &Neurotology
	207YP0228X	Physicians/Otolaryngology/Pediatric Otolaryngology
	207YX0007X	Physicians/Otolaryngology/Plastic Surgery within the Head & Neck
	207YS0012X	Physicians/Otolaryngology/Sleep Medicine***
Anesthesiology	207L00000X	Physicians/Anesthesiology
	207LC0200X	Physicians/Anesthesiology/Critical Care Medicine
	207LP3000X	Physicians/Anesthesiology/Pediatric Anesthesiology
	207RC0000X	Physicians/Internal Medicine, Cardiovascular Disease
	207LA0401X	Physician/Anesthesiology, Addiction Medicine***
	207LH0002X	Physician/Anesthesiology, Hospice and Palliative Medicine***
	207LP2900X	Physician/Anesthesiology, Pain Medicine***
Dermatology	207N00000X	Physicians/Dermatology
	207NI0002X	Physicians/Dermatology, Clinical & Laboratory Dermatological Immunology
	207ND0101X	Physicians/Dermatology, MOHS-Micrographic Surgery
	207ND0900X	Physicians/Dermatology, Dermapathology
	207NP0225X	Physicians/Dermatology, Pediatric Dermatology
	207NS0135X	Allopathic &Osteopathic Physicians/Dermatology, Procedural Dermatology

Table 5.C.5 *(continued)*

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
Obstetrics & Gynecology	207V00000X	Physicians/Obstetrics & Gynecology
	207VB0002X	Physicians/Obstetrics & Gynecology, Bariatric Medicine
	207VC0200X	Physicians/Obstetrics & Gynecology, Critical Care Medicine
	207VF0040X	Physicians/Obstetrics & Gynecology, Female Pelvic Medicine and Reconstructive Surgery
	207VX0201X	Physicians/Obstetrics & Gynecology, Gynecologic Oncology
	207VG0400X	Physicians/Obstetrics & Gynecology, Gynecology
	207VM0101X	Physicians/Obstetrics & Gynecology, Maternal & Fetal Medicine
	207VX0000X	Physicians/Obstetrics & Gynecology, Obstetrics
	207VE0102X	Physicians/Obstetrics & Gynecology, Reproductive Endocrinology
	207VH0002X	Physicians/Obstetrics & Gynecology, Hospice and Palliative Medicine***
Ophthalmology	207W00000X	Physicians/Ophthalmology
	207WX0009X	Physicians/Ophthalmology, Glaucoma Specialist
	207WX0107X	Physicians/Ophthalmology, Retina Specialist
	207WX0108X	Physicians/Ophthalmology, Uveitis and Ocular Inflammatory Disease
	207WX0109X	Physicians/Ophthalmology/Neuro-ophthalmology
	207WX0110X	Physicians/Ophthalmology/Pediatric Ophthalmology and Strabismus Specialist
	207WX0120X	Physicians/Ophthalmology, Cornea and External Diseases Specialist
	207WX0200X	Physicians/Ophthalmic Plastic and Reconstructive Surgery
	1223S0112X	Physicians/Ophthalmology, Dental Providers/Dentist, Oral & Maxillofacial Surgery
Pathology	207ZP0101X	Physicians/Pathology, Anatomic Pathology
	207ZP0102X	Physicians/Pathology, Anatomic Pathology & Clinical Pathology
	207ZP0104X	Physicians/Pathology, Chemical Pathology
	207ZC0006X	Physicians/Pathology, Clinical Pathology
	207ZP0105X	Physicians/Pathology, Clinical Pathology/Laboratory Medicine
	207ZC0500X	Physicians/Pathology, Cytopathology
	207ZD0900X	Physicians/Pathology, Dermapathology
	207ZF0201X	Physicians/Pathology, Forensic Pathology
	207ZH0000X	Physicians/Pathology, Hematology
	207ZI0100X	Physicians/Pathology, Immunopathology
	207ZM0300X	Physicians/Pathology, Medical Microbiology
	207ZP0007X	Physicians/Pathology, Molecular Genetic Pathology
	207ZN0500X	Physicians/Pathology, Neuropathology
	207ZP0213X	Physicians/Pathology, Pediatric Pathology
Physical Medicine & Rehabilitation	208100000X	Physicians/Physical Medicine & Rehabilitation
	2081H0002X	Physicians/Physical Medicine & Rehabilitation, Hospice and Palliative Medicine
	2081N0008X	Physicians/Physical Medicine & Rehabilitation, Neuromuscular Medicine
	2081P2900X	Physicians/Physical Medicine & Rehabilitation, Pain Medicine
	2081P0010X	Physicians/Physical Medicine & Rehabilitation, Pediatric Rehabilitation Medicine
	2081P0004X	Physicians/Physical Medicine & Rehabilitation, Spinal Cord Injury Medicine
	2081S0010X	Physicians/Physical Medicine & Rehabilitation, Sports Medicine
	2081P0301X	Physicians/Physical Medicine & Rehabilitation, Brain Injury
Urology	208800000X	Physicians/Urology
	2088P0231X	Physicians/Urology, Pediatric Urology
	2088F0040X	Female Pelvic Medicine & Reconstructive Surgery
Internal Medicine	207RN0300X	Physicians/Internal Medicine, Nephrology
	207RP1001X	Physicians/Internal Medicine, Pulmonary Disease

Table 5.C.5 *(continued)*

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
	207RI0200X	Physicians/Internal Medicine, Infectious Disease
	207RE0101X	Physicians/Internal Medicine, Endocrinology, Diabetes & Metabolism
	207RR0500X	Physicians/Internal Medicine, Rheumatology
	207RC0200X	Physicians/Internal Medicine, Critical Care Medicine
	207RH0000X	Physicians/Internal Medicine, Hematology
	207RH0003X	Physicians/Internal Medicine, Hematology & Oncology
	207RX0202X	Physicians/Internal Medicine, Medical Oncology
	207RA0201X	Physicians/Internal Medicine, Allergy & Immunology***
	207RA0401X	Physicians/Internal Medicine, Addiction Medicine***
	207RB0002X	Physicians/Internal Medicine, Bariatric Medicine***
	207RC0001X	Physicians/Internal Medicine, Clinical Cardiatric Electrophysiology***
	207RG0100X	Physicians/Internal Medicine, Gastroenterology***
	207RH0002X	Physicians/Internal Medicine, Hospice and Palliative Medicine***
	207RH0005X	Physicians/Internal Medicine, Hypertension Specialist***
	207RI0001X	Physicians/Internal Medicine, Clinical & Laboratory Immunology***
	207RI0008X	Physicians/Internal Medicine, Hepatology***
	207RI0011X	Physicians/Internal Medicine, Interventional Cardiology***
	207RM1200X	Physicians/Internal Medicine, Magnetic Resonance Imaging (MRI)***
	207RS0010X	Physicians/Internal Medicine, Sports Medicine***
	207RS0012X	Physicians/Internal Medicine, Sleep Medicine***
	207RT0003X	Physicians/Internal Medicine, Transplant Hepatology***
Eye & Vision	152W00000X	Eye and Vision Service Providers/Optometrist
	152WC0802X	Eye and Vision Service Providers/Optometrist, Corneal and Contact Management
	152WL0500X	Eye and Vision Service Providers/Optometrist, Low Vision Rehabilitation
	152WX0102X	Eye and Vision Service Providers/Optometrist, Occupational Vision
	152WP0200X	Eye and Vision Service Providers/Optometrist, Pediatrics
	152WS0006X	Eye and Vision Service Providers/Optometrist, Sports Vision
	152WV0400X	Eye and Vision Service Providers/Optometrist, Vision Therapy
Podiatric Medicine	213E00000X	Podiatric Medicine & Surgery Service Providers/Podiatrist
	213ES0103X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Foot & Ankle Surgery
	213ES0131X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Foot Surgery
	213EG0000X	Podiatric Medicine & Surgery Service Providers/Podiatrist, General Practice
	213EP1101X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Primary Podiatric Medicine
	213EP0504X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Public Medicine
	213ER0200X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Radiology
	213ES0000X	Podiatric Medicine & Surgery Service Providers/Podiatrist, Sports Medicine
Psychiatry & Neurology	2084A0401X	Physicians/Psychiatry & Neurology
	2084A2900X	Physicians/Psychiatry & Neurology/Neurocritical Care
	2084P0802X	Physicians/Psychiatry & Neurology, Addiction Psychiatry
	2084B0002X	Physicians/Psychiatry & Neurology, Bariatric Medicine
	2084P0804X	Physicians/Psychiatry & Neurology, Child & Adolescent Psychiatry
	2084N0600X	Physicians/Psychiatry & Neurology, Clinical Neurophysiology
	2084D0003X	Physicians/Psychiatry & Neurology, Diagnostic Neuroimaging
	2084F0202X	Physicians/Psychiatry & Neurology, Forensic Psychiatry
	2084P0805X	Physicians/Psychiatry & Neurology, Geriatric Psychiatry
	2084H0002X	Physicians/Psychiatry & Neurology, Hospice & Palliative Medicine
	2084P0005X	Physicians/Psychiatry & Neurology, Neurodevelopmental Disabilities

Table 5.C.5 *(continued)*

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
	2084N0400X	Physicians/Psychiatry & Neurology, Neurology
	2084N0402X	Physicians/Psychiatry & Neurology, Neurology with Special Qualifications in Child Neurology
	2084N0008X	Physicians/Psychiatry & Neurology, Neuromuscular Medicine
	2084P0301X	Psychiatry & Neurology/Respiratory, Developmental, Rehabilitative and Restorative Service , Brain Injury Medicine
	2084P2900X	Physicians/Psychiatry & Neurology, Pain Medicine
	2084P0800X	Physicians/Psychiatry & Neurology, Psychiatry
	2084P0015X	Physicians/Psychiatry & Neurology, Psychosomatic Medicine
	2084S0010X	Physicians/Psychiatry & Neurology, Sports Medicine
	2084V0102X	Physicians/Psychiatry & Neurology, Vascular Neurology
	2084B0040X	Physicians/Psychiatry & Neurology, Behavioral Neurology & Neuropsychiatry***
	2084S0012X	Physicians/Psychiatry & Neurology, Sleep Medicine***
Radiology/Nuclear Medicine	2085R0001X	Physicians/Radiology, Radiation Oncology
	2085R0202X	Physicians/Radiology, Diagnostic Radiology
	1223X0008X	Oral and Maxillofacial Radiology***
	2085B0100X	Physician/Radiology/Body Imaging***
	2085D0003X	Physician/Radiology/Diagnostic Neuroimaging***
	2085N0700X	Physician/Radiology/Neuroradiology***
	2085N0904X	Physician/Radiology/Nuclear Radiology***
	2085P0229X	Physician/Radiology/Pediatric Radiology***
	2085R0203X	Physician/Radiology/Therapeutic Radiology - Radiation Therapist***
	2085R0204X	Physician/Radiology/Vascular & Interventional Radiology***
	2085R0205X	Physician/Radiology/Radiological Physics***
	2085U0001X	Physician/Radiology/Diagnostic Ultrasound***
	207U00000X	Physicians/Nuclear Medicine***
	207UN0901X	Physicians/Nuclear Medicine, Nuclear Cardiology***
	207UN0902X	Physicians/Nuclear Medicine, Nuclear Imaging & Therapy***
	207UN0903X	Physicians/Nuclear Medicine, In Vivo & In Vitro Nuclear Medicine***
Emergency Medicine	207P00000X	Physicians/Emergency Medicine
	207PE0004X	Physicians/Emergency Medicine, Emergency Medical Services
	207PH0002X	Physicians/Emergency Medicine, Hospice and Palliative Medicine
	207PP0204X	Physicians/Emergency Medicine, Pediatric Emergency Medicine
	207PS0010X	Physicians/Emergency Medicine, Sports Medicine
	207PE0005X	Physicians/Emergency Medicine, Undersea and Hyperbaric Medicine
	207PT0002X	Physicians/Emergency Medicine, Medical Toxicology***
Other	261QM1300X	Ambulatory Health Care Facilities/Clinic/Center, Multi-Specialty
	207RA0001X	Physicians/Advanced Heart Failure and Transplant Cardiology
	207QH0002X	Physicians/Family Medicine, Hospice and Palliative Medicine***
	204C00000X	Physicians/Neuromusculoskeletal Medicine, Sports Medicine***
	207QA0401X	Physicians/Family Medicine, Addiction Medicine***
	207QB0002X	Physicians/Family Medicine, Bariatric Medicine***
	207QS0010X	Physicians/Family Medicine, Sports Medicine***
	207QS1201X	Physicians/Family Medicine, Sleep Medicine***
	2080H0002X	Physicians/Pediatrics, Hospice and Palliative Medicine***
	2080N0001X	Physicians/Pediatrics, Neonatal-Perinatal Medicine***
	2080P0201X	Physicians/Pediatrics, Pediatric Allergy & Immunology***
	2080P0202X	Physicians/Pediatrics, Pediatric Cardiology***
	2080P0203X	Physicians/Pediatrics, Pediatric Critical Care Medicine***

Table 5.C.5 *(continued)*

Medicare practitioner-type description	Practitioner taxonomy code	Practitioner taxonomy description
	2080P0204X	Physicians/Pediatrics, Pediatric Emergency Medicine***
	2080P0205X	Physicians/Pediatrics, Pediatric Endocrinology***
	2080P0206X	Physicians/Pediatrics, Pediatric Gastroenterology***
	2080P0207X	Physicians/Pediatrics, Pediatric Hematology-Oncology***
	2080P0208X	Physicians/Pediatrics, Pediatric Infectious Diseases***
	2080P0210X	Physicians/Pediatrics, Pediatric Nephrology***
	2080P0214X	Physicians/Pediatrics, Pediatric Pulmonology***
	2080P0216X	Physicians/Pediatrics, Pediatric Rheumatology***
	2080S0010X	Physicians/Pediatrics, Sports Medicine***
	2080S0012X	Physicians/Pediatrics, Sleep Medicine***
	2080T0004X	Physicians/Pediatrics, Pediatric Transplant Hepatology***
	2083A0100X	Physicians/Preventive Medicine, Aerospace Medicine***
	2083P0011X	Physicians/Preventive Medicine, Undersea and Hyperbaric Medicine***
	2083P0500X	Physicians/Preventive Medicine, Preventive Medicine/Occupational Environmental Medicine***
	2083S0010X	Physicians/Preventive Medicine, Sports Medicine***
	2083X0100X	Physicians/Preventive Medicine, Occupational Medicine***
	208VP0000X	Physicians/Pain Medicine, Pain Medicine***
	208VP0014X	Physicians/Pain Medicine, Interventional Pain Medicine***

Source: Centers for Medicare & Medicaid Services. “Crosswalk Medicare Provider/Supplier to Healthcare Provider Taxonomy.” Baltimore, MD: CMS. Available at https://data.cms.gov/Medicare-Enrollment/CROSSWALK-MEDICARE-PROVIDER-SUPPLIER-to-HEALTHCARE/j75i-rw8y. Accessed May 8, 2020.

Notes: Descriptions annotated with three asterisks (***) are categories added since our second annual report. These new specialist categories were added to ensure consistency across measures. The specialty designations are now the same across the measures of ambulatory visits, continuity/fragmentation of care, and comprehensiveness of care measures.

Table 5.C.6. Ambulatory visit HCPCS/CPT codes and revenue center codes

Place of service	HCPCS/CPT codes	Revenue center codes
Office/outpatient, home; Federally Qualified Health Center; Critical Access Hospital; Rural Health Clinic	99201–99205, 99211–99215, 99324–99328, 99334–99337, 99339–99345, 99347–99350, 99354–99355, 99358–99359, 99415–99416, 99381–99387; 99391-99397, 98966-98968[a], 99441–99443[a], 98969[a], 99444, 98970–98972, 99421–99423, 99453–99454, 99457, 99458, 99461, 99474, 99483–99484, 99487, 99489–99491, G2058, G2064–G2065, 99492–99498, 99091, 90785, 90791–90792, 90832, 90834, 90837, 90833, 90836, 90838–90840, 90845–90847, 90849, 90853, 96150–96155, 96156, 96158, 96164, 96167, 96170, 96159, 96165, 96168, 96171, 99420, 96160–96161, 97151-97158, G0076-G0087, G2010, G2011, G2012, G2061–G2063, G2076, G2086–G2088, G0402, G0438, G0439, G0502–G0507, G0513–G0514, G9978–G9986, G9987, 99241–99245[b], 99401–99404[b], 99406[b], 99407–99409[b], 99411–99412[b], 99429[b], G0101–G0102[b], G0108–G0109[b], G0296[b], G0396–G0397[b], G0442–G0447[b], G0473[b], Q0091[b]	n.a.
Federally Qualified Health Center only	G0466–G0468, G0469–G0470	n.a.
Critical Access Hospital only	G0463	
Federally Qualified Health Center or Rural Health Clinic only	G0511, G0512, G0071, G2025	0521, 0522, 0527, 0528

Sources: American Medical Association. “CPT, Professional Edition.” 2016–2020; American Medical Association. “HCPCS Level II, Professional Edition.” 2016–2020.

Note: For this annual report, we expanded the list to include: (1) new procedure codes in 2020, and (2) codes that existed before and were added to our list to ensure consistency in the definition of primary care services across studies (see footnote b).

[a] These CPT codes existed prior to 2016 and will not be shown in Table 5.C.8 (code changes instituted by the CPT Editorial Panel during the analytic time period). They were added to the list for the third annual report to align with new online and telephonic assessment and E&M codes the CPT Editorial Panel added in 2019.

[b] These CPT codes existed prior to 2016 and will not be shown in Table 5.C.8 (code changes instituted by the CPT Editorial Panel during the analytic time period). They were added to the list for this report to align with the narrow definition of primary care services that others have used to measure primary care spending in both the Medicare and the commercially insured populations (Bailit et al. 2017; Reid et al. 2019; Kempski and Greiner 2020).

HCPCS/CPT = Health Care Common Procedure Coding System/Current Procedural Terminology; n.a. = not applicable.

Table 5.C.7. Detailed description of the HCPCS/CPT codes and revenue center codes used to identify ambulatory visits

HCPCS/CPT codes	HCPCS/CPT code description	Ambulatory visit indicator[a]	Place of service indicator[b]
99201–99205, 99211–99215	Evaluation and Management (E&M): office or outpatient	1	
99324–99337	Evaluation and Management (E&M): domiciliary, rest home, or custodial care	1	
99339–99340	Evaluation and Management (E&M): domiciliary, rest home, or home care plan oversight	1	
99341–99345, 99347–99350	Evaluation and Management (E&M): home services	1	
99354–99355	Prolonged E&M or Psychotherapy Service w/Direct Patient Contact	0	Yes
99358–99359	Prolonged E&M Service w/o Direct Patient Contact	0	Yes
99415–99416	Prolonged E&M Service w/Direct Patient Contact w/physician supervisor	0	Yes
99381–99387, 99391–99397	Preventive Medicine Services	1	
98966–98968 99441–99443	Telephone assessment & management Telephone E&M	1	
98969 99444	Online assessment & management Online E&M	1	
98970–98972	Online digital assessment	1	
99421–99423	Online digital E&M services – physicians or other qualified health professionals	1	
99453–99454	Chronic Care Remote Patient Monitoring Codes	1	
99457	Remote physiologic monitoring treatment management services, initial 20 minutes	1	
99458	Remote physiologic monitoring treatment management services, additional 20 minutes	0	
99461	Initial care per day, for E&M of normal newborn infant seen in other than hospital or birthing center	1	
99474	Home blood pressure monitoring support	1	
99483	Cognitive Assessment	1	
99484	General Behavioral Health Integration Care Management	1	
99487	Complex Chronic Care Management Services, initial 60 minutes	1	
99489	Complex Chronic Care Management Services , additional 30 minutes	0	
99490	Chronic Care Management, initial 20 minutes	1	
G2058	Chronic Care Management, each additional 20 minutes	0	
99491	Chronic care management services, provided personally by a physician or other qualified health care professional	1	
G2064	Principal care management service at least 30 minutes	1	
G2065	Principal care management service at least 30 minutes – clinical staff time directed by a physician or other qualified health care professional	1	
99492–99493	Psychiatric Collaborative Care Management (CoCM)	1	
99494	Psychiatric Collaborative Care Management (CoCM), each additional 30 minutes	0	
99495–99496	Transitional Care Management Services	1	Yes
99497	Advanced directive counseling and discussion	1	
99498	Advanced directive counseling and discussion, each additional 30 minutes	0	Yes
99091	Remote Physiologic Patient Monitoring	1	
90785	(Psych) Interactive complexity (in addition to primary procedure)	0	Yes

Table 5.C.7 *(continued)*

HCPCS/CPT codes	HCPCS/CPT code description	Ambulatory visit indicator[a]	Place of service indicator[b]
90791–90792	Psychiatric diagnostic evaluation	1	Yes
90832, 90834, 90837	Psychotherapy	1	Yes
90833, 90836, 90838	Psychotherapy in conjunction w/E&M code	0	Yes
90839	Psychotherapy for crisis	1	Yes
90840	Psychotherapy for crisis, each additional 30 minutes	0	Yes
90845–90847	Other psychotherapy	1	Yes
90849	Multiple family	1	Yes
90853	Group psychotherapy	1	Yes
96150–96151	Health and Behavior Assessment/Intervention	1	Yes
96156	Health behavior assessment or re-assessment	1	Yes
96152–96155	Health & behavior intervention, each 15 minutes	1	Yes
96158, 96164, 96167, 96170	Health behavior intervention, initial 30 minutes	1	Yes
96159, 96165, 96168, 96171	Health behavior intervention, each additional 15 minutes	0	Yes
99420	Administration and interpretation of health risk assessments	1	
96160–96161	Administration of health risk assessment	1	
97151-97158	Adaptive Behavior Therapy assessment and treatment codes	1	
G0076-G0087	Care management home visit	1	
G2010	Remote evaluation of recorded video and/or images submitted by an established patient	1	
G2011	Alcohol and/or substance abuse structured assessment and brief intervention	1	
G2012	Virtual check-in by a physician or other qualified health care professional who can report E&M services	1	
G2061–G2063	Qualified nonphysician healthcare professional online assessment and management service, for an established patient	1	
G2076	Intake activities, including a physician assessment	1	Yes
G2086–G2088	Office-based treatment for opioid use disorder	1	
G0402	Initial exam for Medicare enrollment	1	
G0438–G0439	Counseling, Wellness, and Screening Services	1	
G0502–G0503	Initial or subsequent psychiatric collaborative care management	1	
G0504	Initial or subsequent psychiatric collaborative care management, each additional 30 minutes	0	
G0505	Cognition and functional assessment using standardized instruments with development of recorded care plan for the patient with cognitive impairment	1	
G0506	Comprehensive assessment and care planning for patients needing chronic care	1	
G0507	Care management services for behavioral health conditions	1	
G0513–G0514	Prolonged Preventive Services	0	
G9978–G9986	Remote in-home visit for the E&M of a patient	1	
G9987	Bundled payments (BPCI advanced) model home visit for patient assessment	1	
99241–99245	Office or other outpatient consultations	1	
99401–99404	Preventive medicine counseling and/or risk reduction intervention	1	
99406	Smoking and tobacco use cessation counseling visit, greater than 3 minutes up to 10 minutes	1	
99407	Smoking and tobacco use cessation counseling visit, intensive, greater than 10 minutes	1	
99408–99409	Alcohol/Substance Abuse Screening	1	

Table 5.C.7 *(continued)*

HCPCS/CPT codes	HCPCS/CPT code description	Ambulatory visit indicator[a]	Place of service indicator[b]
99411–99412	Group preventive medicine counseling and/or risk reduction intervention	1	
99429	Unlisted preventive medicine service	1	
G0101	Cervical or vaginal cancer screening; pelvic and clinical breast examination	1	
G0102	Prostate cancer screening; digital rectal examination (DRE)	1	
G0108	Diabetes outpatient self-management training services, individual, per 30 minutes	1	
G0109	Diabetes outpatient self-management training services, group session (2 or more), per 30 minutes	1	
G0296	Visit to determine lung cancer screening eligibility	1	
G0396	Alcohol and/or substance abuse structured screening and brief intervention services; 15 to 30 min	1	
G0397	Alcohol and/or substance abuse structured screening and brief intervention services; greater than 30 min	1	
G0442	Annual alcohol misuse screening, 15 minutes	1	
G0443	Brief face-to-face behavioral counseling for alcohol misuse, 15 minutes	1	
G0444	Annual depression screening	1	
G0445	High intensity behavioral counseling to prevent sexually transmitted infection	1	
G0446	Annual, face-to-face intensive behavioral therapy for cardiovascular disease, individual, 15 minutes	1	
G0447	Face-to-face behavioral counseling for obesity, 15 minutes	1	
G0473	Face-to-face behavioral counseling for obesity, group (2–10), 30 minutes	1	
Q0091	Screening Papanicolaou smear; obtaining, preparing and conveyance of cervical or vaginal smear to lab	1	
Critical Access Hospitals only			
G0463	Hospital OP clinic visit	1	
Federally Qualified Health Centers only			
G0466–G0467	FQHC visit	1	
G0468	FQHC visit with AWV or IPPE	1	
G0469–G0470	FQHC mental health visit - new patient	1	
Rural Health Clinic/Federally Qualified Health Center only			
G0071	Non-face-to-face communication between RHC/FQHC practitioner and patient in lieu of an office visit	1	
G0511	General Care Management	1	
G0512	Psychiatric collaborative care management	1	
G2025	Distant site telehealth services	1	

Table 5.C.7 *(continued)*

Revenue center codes	Revenue center code description	Ambulatory visit indicator[a]	Place of service indicator[b]
Rural Health Clinic/Federally Qualified Health Center only			
0521	Clinic visit by member to RHC/FQHC	1	
0522	Home visit by RHC/FQHC practitioner	1	
0527	RHC/FQHC Visiting Nurse Service(s) to a member's home when in a home health shortage area	1	
0528	Visit by RHC/FQHC practitioner to other non-RHC/FQHC site (e.g., scene of accident)	1	

Sources: American Medical Association. "CPT, Professional Edition." 2016–2020; American Medical Association. "HCPCS Level II, Professional Edition." 2016–2020.

Notes: This table has been updated to include newly effective codes in 2020. It reflects CPT/HCPCS code changes instituted by the CPT Editorial Panel during the analytic time period (see Table 5.C.8 below). The CPT Editorial Panel comprises 17 members, 11 of whom are physicians, responsible for maintaining the CPT code set for the American Medical Association. Procedure codes used in the identification of non-face-to-face ambulatory visits are shaded in **green**.

[a] Procedure codes with an ambulatory visit indicator of one are included in the visit counts. Indicators with a value of zero indicate add-on services and are not counted as a separate visit.

[b] Some procedure codes that are included in our ambulatory visit definition are also provided in non-ambulatory settings. These services have a place of service indicator equal to "yes" and are counted in our visit and expenditure calculations only if the place of service is not an institutional setting. This excludes services with place of service = 21 (Inpatient Hospital), 51 (Inpatient Psychiatric Facility), 55 (Residential Substance Abuse Treatment Facility), 56 (Psychiatric Residential Treatment Center), or 61 (Comprehensive Inpatient Rehabilitation Facility).

AWV = Annual Wellness Visit; BPCI = Bundled Payments for Care Improvement; CoCM = Collaborative Care Model; FQHC = Federally Qualified Health Center; HCPCS/CPT = Health Care Common Procedure Coding System/Current Procedural Terminology; IPPE = Initial Preventive Physical Examination; OP = Outpatient; RHC = Rural Health Clinic.

Table 5.C.8. Ambulatory HCPCS/CPT code changes instituted by the CPT Editorial Panel[a] during the analytic time period

HCPCS/CPT codes	HCPCS/CPT code description	Year added	Year replaced
99444	Online E&M	Prior to 2016	Deleted in 2020 and replaced with 99421–99423
99420	Administration and interpretation of health risk assessments	Prior to 2016	Deleted in 2017 and replaced with 96160–96161
99497	Advance directive counseling and discussion	2016	
99498	Each additional 30 minutes	2016	
96160–96161	Administration of health risk assessment	2017	
99487	Complex Chronic Care Management Services	2017	
99489	Additional 30 minutes	2017	
99490	Chronic Care Management	2017	
G0502–G0503	Initial or subsequent psychiatric collaborative care management (CoCM)	2017	Deleted in 2018 and replaced with 99492–99494
G0504	Initial or subsequent psychiatric collaborative care management, each additional 30 minutes	2017	Deleted in 2018 and replaced with 99494
G0505	Cognition and functional assessment using standardized instruments with development of recorded care plan for the patient with cognitive impairment	2017	Deleted in 2018 and replaced with 99483
G0506	Comprehensive assessment and care planning for patients needing chronic care	2017	
G0507	Care management services for behavioral health conditions	2017	Deleted in 2018 and replaced with 99484
99091	Remote Physiologic Patient Monitoring	2018	
99483	Cognitive Assessment	2018	
99484	General Behavioral Health Integration Care Management	2018	
99492–99494	Psychiatric Collaborative Care Management	2018	
99453-99454	Chronic Care Remote Patient Monitoring Codes	2019	
99457	Remote physiologic monitoring treatment management services	2019	
99491	Chronic care management services, provided personally by a physician or other qualified health care professional	2019	
97151-97158	Adaptive Behavior Therapy assessment and treatment codes	2019	
G0076- G0087	Care management home visit	2019	
G2010	Remote evaluation of recorded video and/or images submitted by an established patient	2019	
G2011	Alcohol and/or substance abuse structured assessment and brief intervention	2019	
G2012	Virtual check-in by a physician or other qualified health care professional who can report E&M services	2019	
G9978-G9986	Remote in-home visit for the E&M of a patient	2019	
G9987	Bundled payments (BPCI advanced) model home visit for patient assessment	2019	
98970–98972	Online digital assessment	2020	
99421–99423	Online digital E&M services – physicians or other qualified health professionals	2020	
99458	Remote physiologic monitoring treatment management services + 20 minute add-on code	2020	
99474	Home blood pressure monitoring support	2020	
G2058	Chronic Care Mgt each additional 20 minutes	2020	
G2064	Principal care management service at least 30 minutes	2020	

Table 5.C.8. ***(continued)***

HCPCS/CPT codes	HCPCS/CPT code description	Year added	Year replaced
G2065	Principal care management service at least 30 minutes – clinical staff time directed by a physician or other qualified health care professional	2020	
96156	Health behavior assessment or re-assessment	2020	
96158, 96164, 96167, 96170	Health behavior intervention, initial 30 minutes	2020	
96159, 96165, 96168, 96171	Health behavior intervention, each additional 15 minutes	2020	
G2061–G2063	Qualified nonphysician healthcare professional online assessment and management service, for an established patient	2020	
G2076	Intake activities, including a physician assessment	2020	
G2086–G2088	Office-based treatment for opioid use disorder	2020	
Rural Health Clinic/Federally Qualified Health Center only			
G0511	General Care Management	2018	
G0512	Psychiatric Collaborative Care Management	2018	
G0071	Non-face-to-face communication between RHC/FQHC practitioner and patient in lieu of an office visit	2019	
G2025	Distant site telehealth services	2020	

Sources: American Medical Association. "CPT, Professional Edition." 2016–2019; American Medical Association. "HCPCS Level II, Professional Edition." 2016–2020.

[a] The CPT Editorial Panel comprises 17 members, 11 of whom are physicians, responsible for maintaining the CPT code set for the American Medical Association.

BPCI = Bundled Payments for Care Improvement; CoCM = Collaborative Care Model; HCPCS/CPT = Health Care Common Procedure Coding System/Current Procedural Terminology.

C. Planned care and population health

We constructed a total of 11 claims-based measures under the planned care and population health domain. We constructed six of the measures applying the 2018 specifications obtained from the Healthcare Effectiveness Data and Information Set (HEDIS; available at http://www.ncqa.org/hedis-quality-measurement/hedis-measures/hedis-2018) on Medicare Part A and B claims. The remaining five measures used Part D prescription drug claims data. Two of these were approximations of MIPS clinical quality measures included in the QPP program and were based on measure descriptions from the QPP program; the other three used specifications and value sets from the Pharmacy Quality Alliance (PQA).

C.1. Measures constructed using Medicare Part A and B claims

Five of the six HEDIS measures constructed using Medicare Part A and B claims were for Medicare FFS beneficiaries ages 18 to 75 with diabetes, and one was for breast cancer screening among women ages 52 through 74. In line with the HEDIS specifications, we restricted the five diabetes measures to beneficiaries with continuous Medicare FFS Part A and B enrollment during the 12-month performance period (that is, the year for which the measure is being defined). The breast cancer screening measure required continuous Medicare FFS Part A and Part B enrollment during the 27-month measurement period. Given that we do not have access to more recent versions of the HEDIS specifications, each year we conduct our own review of recent procedure code and diagnosis code changes and update the HEDIS value data sets (VDS) as needed. Our review of new 2020 codes for the VDS for this report identified the addition of three CPT codes for the HEDIS outpatient visit data set.[59] In Table 5.C.9, we summarize the measure specifications and note where our approach deviates from the approach in the HEDIS specifications. For example, we did not use prescription drug data in constructing these six measures.

[59] The new procedure codes are 99421–99423 for outpatient visits.

Table 5.C.9. Measures based on 2018 HEDIS specifications used for the planned care and population health domain

Measure	Measure numerator	Measure denominator
HbA1c testing	Beneficiaries had an HbA1c test performed during the measurement year.	• Beneficiaries had to be continuously enrolled in FFS Medicare during the measurement year. • Beneficiaries are excluded if they used hospice services during the measurement year. • Beneficiaries ages 18–75 with diabetes (Type 1 or Type 2), defined as having one of the following during the measurement year or the prior year: – Two face-to-face encounters in an outpatient setting or non-acute inpatient setting on different dates of service, with a diagnosis of diabetes. – One face-to-face encounter in an acute inpatient setting, with a diagnosis of diabetes. • Beneficiaries with gestational or steroid-induced diabetes during the measurement year or the prior year were excluded. Notes: We modified the HEDIS “continuously enrolled” criteria by: • Requiring enrollment each month, rather than allowing a 45-day gap in enrollment.(HEDIS considers a beneficiary to have continuous enrollment if the beneficiary had no more than one gap in enrollment of up to 45 days during the measurement year.) • Expanding the criteria for enrollment to match our eligibility criteria for the CPC+ evaluation—a beneficiary is Medicare FFS eligible in a month if the beneficiary is eligible for Part A and Part B with Medicare being the primary payer, not enrolled in an HMO in the month, and alive during any part of the month. We modified the HEDIS denominator by: • Using a broad range of E codes for identification of diabetes diagnoses (E10-E13). • Removing 99420 from the Outpatient VDS (new codes 96160 and 96161 are not included). • Not including code 99483 from the Outpatient VDS.

Table 5.C.9 *(continued)*

Measure	Measure numerator	Measure denominator
Eye exam (retinal) performed	Beneficiaries had an eye exam during the measurement year, defined as having one of the following: • A retinal or dilated eye exam by an eye care professional (optometrist or ophthalmologist) in the measurement year. • A negative retinal or dilated eye exam (negative for retinopathy) by an eye care professional in the year prior to the measurement year. Notes: We modified the HEDIS measure by: • Not including eye enucleation in the numerator. • Adding ICD-9 codes for diabetes without complications for prior year identification of retinal exams, because analogous ICD-10 codes were added to the HEDIS measure in 2017.	Same as above
Medical attention for nephropathy	Beneficiaries had a nephropathy screening or monitoring test OR evidence of nephropathy during the measurement year, defined as having one of the following during the measurement year: • A nephropathy screening or monitoring test • Evidence of treatment for nephropathy or ACE/ARB therapy • Evidence of Stage 4 chronic kidney disease • Evidence of end-stage renal disease • Evidence of kidney transplant • A visit with a nephrologist	Same as above
Composite diabetes care measure for receiving all three tests	Beneficiaries received all three tests during the measurement year—an HbA1c test, an eye exam, and medical attention for nephropathy.	Same as above
Composite diabetes care measure for not receiving any of the three tests	Beneficiaries did not receive any of the three tests during the measurement year—an HbA1c test, an eye exam, and medical attention for nephropathy.	Same as above

Table 5.C.9 *(continued)*

Measure	Measure numerator	Measure denominator
Breast cancer screening	Beneficiaries with one or more mammograms any time on or between October 1 two years prior to the start of the measurement year and December 31 of the measurement year.	• Beneficiaries had to be continuously enrolled during the measurement year and for the 15 months prior to the measurement year. • Beneficiaries are excluded if they used hospice services during the measurement year. • Women ages 52–74 as of December 31 of the measurement year. • Beneficiaries who had a bilateral mastectomy or a right and a left unilateral mastectomy were excluded. We used claims back to 2013 to identify these exclusions. Note: This measure incorporated the same deviations from HEDIS for the continuously enrolled criteria.

Source: National Committee for Quality Assurance (NCQA). "HEDIS Volume 2: Technical Specifications." 2016–2018.

HbA1c = Hemoglobin A1c test; HEDIS = Healthcare Effectiveness Data and Information Set; ICD-9 = International Classification of Diseases Version 9; ICD-10 = International Classification of Diseases Version 10; VDS = HEDIS value data set.

C.2. Measures constructed using Medicare Part D claims

We created two measures that were approximations of MIPS clinical quality measures included in the QPP program: (1) Percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy ("statin therapy") and (2) Percentage of beneficiaries with both coronary artery disease (CAD) and diabetes who were prescribed angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) therapy ("ACE/ARB therapy"). These measures were restricted to beneficiaries who had continuous Medicare FFS Parts A, B, and D enrollment during the measurement year and no hospice utilization that year. Table 5.C.10 provides details on the denominators and numerators for these measures.

Percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy. The statin therapy measure approximates the MIPS clinical quality measure "statin therapy for the prevention and treatment of cardiovascular disease" (Quality ID #438). Because we cannot measure the concept of prevention or determine low-density lipoprotein cholesterol levels in claims data, the denominator for our approximation is restricted to adults 21 years of age or older who were previously diagnosed with or currently have an active diagnosis of atherosclerotic cardiovascular disease or who have an active diagnosis of familial or pure hypocholesterolemia. (A detailed description of the 2020 MIPS measure can be found at https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2020_Measure_438_MIPSCQM_v4.1.pdf.)

Percentage of beneficiaries with both CAD and diabetes who were prescribed ACE inhibitors or ARB therapy. The ACE/ARB therapy measure approximates the MIPS clinical quality measure "coronary artery disease: ACE inhibitor or ARB therapy - diabetes or left ventricular systolic dysfunction (LVEF < 40%)" (Quality ID #118). The denominator for our approximation is restricted to beneficiaries 18 years old or older with CAD and diabetes because we cannot identify LVEF in claims data. (A detailed description of the 2020 MIPS measure can be found at https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2020_Measure_118_MIPSCQM.pdf.)

Table 5.C.10. Prescription drug-related measures based on 2020 MIPS specifications used for the planned care and population health domain

Measure	Measure numerator	Measure denominator
Percentage of beneficiaries with cardiovascular disease who were prescribed statin therapy	Receipt of a statin medication as identified in the Part D prescription drug event data during the performance year	• Beneficiaries had to be continuously enrolled in FFS Medicare and Medicare Part D during the measurement year. • Beneficiaries 21 years of age or older who were previously diagnosed with or currently have an active diagnosis of atherosclerotic cardiovascular disease or who have an active diagnosis of familial or pure hypocholesterolemia during the measurement year. • Beneficiaries are excluded if they used hospice services, were pregnant or breastfeeding, or had a diagnosis of rhabdomyolysis during the measurement year. Exceptions include active liver or hepatic disease or insufficiency or end-stage renal disease.
Percentage of beneficiaries with both CAD and diabetes who were prescribed ACE inhibitors or ARB therapy	Receipt of an ACE/ARB medication as identified in the Part D prescription drug event data during the performance year	• Beneficiaries had to be continuously enrolled in FFS Medicare and Medicare Part D during the measurement year. • Beneficiaries 18 years old or older with two encounters with diagnoses of CAD and diabetes during the measurement year. • Beneficiaries are excluded if they used hospice services during the measurement year.

Notes: Yearly NDC mappings from NCQA were used to identify ACE/ARB medications. (The downloadable NDC files are available in the HEDIS® technical resources section at https://www.ncqa.org/hedis/measures/.) We expanded the criteria for Medicare FFS enrollment to match our eligibility criteria for the CPC+ evaluation—beneficiaries are Medicare FFS eligible in a month if they are enrolled in both Part A and Part B with Medicare being the primary payer, not enrolled in an HMO during the month, and alive during any part of the month.

ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blockers; CAD = coronary artery disease; FFS = fee-for-service; HMO = health maintenance organization; NCQA = National Committee on Quality Assurance; NDC = National Drug Codes.

Finally, we constructed three measures using specifications and value sets from the Pharmacy Quality Alliance (PQA). These measures are **the percentage of beneficiaries on diabetes medications, renin-angiotensin system antagonists, or statins, respectively, with proportion of days covered by medication > 80%**.

The denominator for each measure is beneficiaries 18 years or older with at least two dispensing events for a qualifying medication during the year, where a dispensing event is defined as a record in the Part D event data indicating the medication was dispensed by a pharmacy. These measures were restricted to beneficiaries with continuous Medicare FFS Part A, B, and D enrollment during the measurement year. Denominator exclusions are receipt of hospice care or diagnosis of end-stage renal disease (ESRD) during the measurement year. For the diabetes measure, receipt of insulin as identified in the Part D prescription drug event data is an additional exclusion.

The first step to construct the numerators is to determine the number of eligible days, which is the number of days from the first dispensing event to the end of the measurement year. Next, the number of days supply is calculated from all the dispensing events identified in the Part D prescription drug event data during the measurement year. We account for overlapping days supply in the following manner:

- **Overlap of 14 days or fewer.** We consider this to be an early refill and we add the day supply amount to the overall count of days. For example, if fill 1 occurred on June 1, 2020, a 90-day supply would end on August 29, 2020. If a second dispensing event occurred on August 25, 2020, with 90 days supply, we would add the days supply from the two separate dispensing events and count these two events as having a total of 180 days.
- **Overlap of more than 14 days and the next dispensing date is the same as the current dispensing date for different medications in the same class.** This suggests a complementary medication regimen, so we use the dispensing event with the maximum number of days to set the days supply. For example, if a 90-day supply of medication 1 was dispensed on June 1, 2020, and a 30-day supply of medication 2, which is in the same class as medication 1, was dispensed on the same date, the total days supply is 90.
- **Overlap of more than 14 days and the next dispensing date is after the current dispensing date.** This could indicate a switch in medications, so we add the days count from the second dispensing event to the number of days from the previous fill through the date of the second dispensing event. For example, if a 90-day supply was dispensed on June 1, 2020, and another 90-day supply was dispensed on July 1, 2020, the total days supply would be 121 (31 days from the first dispensing event and 90 days from the second dispensing event).
- **Complete overlap with the previous dispensing event.** The days supply from the two events are not added and we use the days supply from one event in the measure calculation.

To construct the final measure, we divide the number of days supply by the number of eligible days. If the result is greater than 0.80, then the beneficiary is considered numerator compliant. We repeat this process for each of the three medications to produce three binary indicators of compliance for the outcome variables. (More information about the PQA measures is available at https://www.pqaalliance.org/assets/Measures/PQA_Measures_Overview.pdf.)

D. Continuity of care

We created seven outcomes measures to examine continuity of care, and we describe those measures in greater detail below. The first three are based on ambulatory visits with primary care practitioners (defined earlier in Section B.4) at a beneficiary's assigned practice, further broken down by whether or not the visit was face-to-face. The next four (two different versions of percentage of visits with the usual provider of care [UPC] and Reverse Bice-Boxerman Index [rBBI]) are based on a slightly narrower set of ambulatory visits to both primary care and specialist practitioners (we refer to these as "qualifying visits") and measure the percentage of those visits with the most frequently seen practitioner and the dispersion of those visits across all practitioners. Beneficiaries were required to meet three criteria to be included in the percentage of visits with the UPC and rBBI continuity of care measures: (1) be in the intent-to-treat (ITT) sample at the beginning of the year; (2) be enrolled in Medicare FFS for the full year; and (3) receive qualifying ambulatory visits in the measurement year.

Percentage of primary care ambulatory visits provided at a beneficiary's assigned practice. For the beneficiaries we identified as having ambulatory visits (Table 5.C.6) with a primary care practitioner (Table 5.C.4), we further examined the percentage of primary care ambulatory visits that were provided by practitioners affiliated with the beneficiary's assigned practice.

Percentage of primary care ambulatory visits provided at a beneficiary's assigned practice: face-to-face visits and **non-face-to-face visits.** These two measures further break down the measure above by whether or not visits were face-to-face. We identified visits as non-face-to-face using the three criteria provided in Section B.4 (procedure codes, modifier codes, and place of service). All other ambulatory visits were considered to be in-person services.

In this report, we created two versions of the additional continuity of care measures. The first uses the same methodology as was reported in the third annual report—each practitioner is counted individually. Since fragmentation calculated at the practitioner (NPI) level may overstate true fragmentation when there is team-based care, we created a second version of the UPC and rBBI measures that combined practitioners in a beneficiary's assigned primary care practice. All practitioners (NPIs) affiliated with a beneficiary's assigned practice were counted as one practitioner instead of being counted as individual practitioners.

Percentage of visits with the usual provider of care where each practitioner is counted separately. The percentage of visits with the UPC measures the proportion of qualifying ambulatory visits with the most frequently seen ambulatory practitioner (Breslau and Reeb 1975; Pollack et al. 2016). Note that the most frequently seen practitioner could have any specialty (e.g., primary care or specialist). UPC was created for beneficiaries with one or more qualifying ambulatory visits. We used a modified version of the National Committee for Quality Assurance's definition of ambulatory visits to identify beneficiaries with office or other outpatient visits (such as to rural health clinics and critical access hospitals) for E&M; ophthalmological services for medical examination and evaluation; or new enrollee and annual wellness visits (Kern et al. 2017; NCQA 2015). A description of these visit codes can be found in Table 5.C.11. The formula for the measure is:

$$\max\left(\frac{n_i}{N}\right) \text{over all } i \text{ practitioners}$$

where n_i is the number of ambulatory visits to practitioner *i* (NPI) during the measurement period, and N is the total number of all ambulatory visits the beneficiary had during the measurement period.

Reversed Bice-Boxerman Index where each practitioner is counted separately. The Bice-Boxerman Continuity of Care Index (COCI) identifies the number of practitioners providing ambulatory services to a beneficiary and the percentage of care provided by each practitioner. The index is created for each beneficiary and is calculated by taking the number of visits to each individual practitioner divided by the total number of visits the beneficiary had overall. A description of the qualifying ambulatory visits is found in Table 5.C.11. This index weights both the frequency of ambulatory visits to each practitioner and the dispersion of visits between practitioners. Index values range from just greater than 0 (visits made to many practitioners) to 1 (all visits made to the same practitioner).

BBI is defined as

$$\left(\sum n_i^2 - N\right) / \left[N\left(N-1\right)\right],$$

where n_i is the number of visits that the beneficiary had with the $i\text{th}$ practitioner, and *N* is the total number of all ambulatory visits the beneficiary had during the measurement period.

We required beneficiaries to have at least four ambulatory visits to qualify for inclusion in the rBBI, because measures of continuity may not be reliable if they are based on three or fewer visits (Nyweide et al. 2013). To measure fragmentation, we reversed raw BBI scores, calculating 1 minus BBI, for beneficiaries who had at least four ambulatory visits. On this rBBI index, higher scores reflect more fragmentation (many providers with a relatively low proportion of ambulatory visits by each provider). Thus, beneficiaries with an rBBI of 0 have no fragmentation of care (all their qualifying visits were to the same provider).

Measuring both the UPC and rBBI is useful, because the UPC facilitates interpretation. Measuring the percentage of visits with the UPC alongside the rBBI can make the findings more transparent, as the difference between two UPC scores (e.g., 30 percent of visits vs. 50 percent of visits with the most frequently seen provider) is easier to interpret than the clinical difference between two rBBI scores (e.g., 0.9 vs. 0.7).

Percentage of visits with the usual provider of care and Reversed Bice-Boxerman Index where all practitioners at the beneficiary's assigned practice are counted as one practitioner. These two outcomes are defined the same as those above, except that all NPIs associated with the beneficiary's assigned practice are counted as a single practitioner.

Table 5.C.11. Procedure codes used for the selection of qualifying ambulatory visits for the UPC and rBBI measures

HCPCS/CPT codes	Description
99201-99205; 99211-99215	Office or other outpatient visit for E&M
92002, 92004, 92012, 92014	Ophthalmological services: medical examination and evaluation
G0402, G0438, G0439	New enrollee and annual wellness visits

E. Comprehensiveness of care

We developed three NPI level measures intended to gauge the comprehensiveness of care provided by primary care physicians. These measures are slight modifications of those originally developed by O'Malley et al. (2019) and Rich et al. (2021). Comprehensiveness is the extent to which a primary care physician meets the large majority of their patient's physical and common mental health care needs. These measures are created for primary care physicians only. Thus, we exclude approximately one-third of CPC+ and comparison group providers from this measure because they are nurse practitioners, physician assistants, or physician specialists.[60] We identify a primary care physician based on the physician's NPI in the Medicare Data on Provider Practice and Specialty (MD-PPAS) file being assigned to a taxonomy code in one of the following specialties: 01 (general practice), 08 (family practice), 11 (internal medicine), 37 (pediatric medicine), or 38 (geriatric medicine). We describe the development of these measures here.

We created two versions of the involvement in patient conditions (IPC) and new problem management (NPM) measures. The first version is consistent with the specifications used for the third annual report. The second version adds telehealth codes to the specifications to more comprehensively capture services provided in 2020 during the coronavirus disease (COVID-19) pandemic. The second version that includes telehealth codes is the one we use for this report to examine impacts of CPC+ on physician comprehensiveness through Program Year (PY) 4. We did not create a second version of the range of services (ROS) measure, because all of the services included in the measure are provided in person (except for behavioral health services, which can be billed with a telehealth modifier and are captured in the existing measure).

IPC. For each physician, this measure calculates the percentage of beneficiaries seen in a given year for whom the physician had the greatest involvement in the patient's conditions. To be included in the analysis, a beneficiary must be eligible for Part A and Part B with Medicare being the primary payer, not enrolled in an HMO, and alive during any part of the analysis period. To calculate this measure, we first identify all beneficiaries seen by a CPC+ or comparison group primary care physician in a given year. We identify all the diagnoses for which the beneficiaries were seen by any physician (both primary care and specialists) for an office-based E&M service, truncated to the first four digits for ICD-10 codes, and we count the total number of these unique diagnosis codes. We developed two versions of this measure. The first version uses CPT codes to define office-based E&M services (99201 to 99205, 99211 to 99215) consistent with the

[60] We estimated the comprehensiveness of primary care physicians rather than nurse practitioners (NPs) and physician assistants (PAs), because of the low prevalence of NPs and PAs serving as a patient's usual practitioner in our sample, and the difficulty of discerning all services independently provided by NPs/PAs because they commonly bill "incident to" services under a physician's NPI.

specifications for this measure in the third annual report. The second version extends the definition to include telehealth visits using both CPT and HCPCS codes (99421–99423, 99441–99443, 99444; G2010, G2012, G2061–G2063). We use the second version in our analyses for the fourth annual report. Once we identify the set of claims with the CPT and HCPCS codes for each version of the measure, for each physician and beneficiary combination, we count the total number of the beneficiary's unique diagnoses on these claims for which the physician billed in the year. We look across the physicians who treated the beneficiary, identify the physician who billed for the plurality of the beneficiary's diagnosis codes, and assign that physician as the most comprehensive for that beneficiary. If multiple physicians billed for the same share of a beneficiary's diagnoses, then we designate all those physicians as the most comprehensive for that beneficiary. Finally, for each physician, we calculate the share of the beneficiaries treated by the physician for whom the physician was the most comprehensive physician.

NPM. This measure assesses the extent to which a physician manages a patient's new symptom or problem instead of referring them to (or the patient seeking) a specialist. The measure focuses on management of the 20 most common reasons for visits to primary care in the Medicare population aged 65 and over.[61]

We calculate this measure annually. For each year, for each beneficiary receiving office-based E&M services or, for the second version of the measure, receiving both office-based and telehealth E&M services from a CPC+ or comparison group primary care physician based on the performing physician NPI, we select the first claim for these services with each condition in Table 5.C.12 based on the diagnosis codes associated with the condition. We call this the index claim for the beneficiary and condition in the analysis year. Similar to the IPC measure, we created two versions of the NPM measure using the same procedure code definitions. We exclude index claims for beneficiaries who are not eligible for the analysis for at least 20 months in the 24 months prior to the index claim thru date and for at least 10 months of the 12 months following the index claim through date. To be eligible for the analysis in a particular month, a beneficiary must be eligible for Part A and Part B with Medicare being the primary payer, not enrolled in an HMO, and alive during any part of the month. Because we want to analyze only "new" problems, we also exclude index claims for which the beneficiary had the same diagnosis on any E&M service[62] performed by any provider in the 24 months prior to the index claim "thru date". We define office-based E&M services to include all codes listed in the top section of Table 5.C.13 for the first version of the metric, and we extend this definition for the second version of the metric to include the telehealth codes in the bottom section of the table. We use the version that includes telehealth codes in our analyses for this report. After these exclusions, we end up with an output file including index claims for all beneficiaries who saw a CPC+ or comparison practice physician for a "new" condition in the year. Next, for each index claim, we

[61] The 20 most common reasons for visits to primary care in the Medicare population aged 65 and older are migraine, headache, urinary tract infection, gastrointestinal symptoms, skin disorders, back problems, hypertension, hyperlipidemia, diabetes, depression, anxiety, arthritis and localized joint syndromes, obesity, asthma, ill-defined conditions, upper respiratory conditions, ischemic heart disease, congestive heart failure, chronic obstructive pulmonary disease, and thyroid disorders.

[62] Because the Berenson-Eggers Type of Service (BETOS) codes have not been updated or maintained since 2016, we moved to individual CPT/HCPCS codes for identification of services instead of BETOS categories in this report. The CPT codes in the table align with the codes in the BETOS categories used in the third annual report.

identify all office-based E&M services with the same beneficiary and condition in the 12 months following the thru date of the index claim and use these claims to calculate the index physician's share of claims for the "new" condition. Then, separately for each of the 20 conditions, we calculate the average across all physicians of share of services performed by the index claim physician.

Finally, for each physician, we calculate a new problem management score. First, we calculated the average share of services the physician provided in the following 12 months for all their "new" condition index claims. To account for differences across physicians in the mix of conditions, we also calculated the predicted value, which is the average of the physician averages with the same mix of conditions. We calculated the new problem management as the ratio of the physician's own average and the predicted average.

Table 5.C.12. Diagnosis codes for new problem management measure

Condition	ICD-9 Codes[a]	ICD-10 Codes[b]
Migraine	346	G43
Headache	7840	G441 R51
Urinary Tract Infection	5990	N390
Gastrointestinal symptoms—includes GERD, acute gastritis without hemorrhage, Infectious colitis, enteritis, and gastroenteritis, salmonella gastroenteritis	0030 0090 0091 53011 53012 5589 578	A020 A09 K209 K210 K523 K5283 K5289 K529 K920-K922
Skin disorders	680-709	B781 E08628 E09628 E832 I7023-I7025 I7033-I7035 I7043-I7045 I7053-I7055 I7063-I7065 I7073-I7075 K122 L00-L05 L080 L088 L10-L14 L20-L30 L40-L43 L440-L443 L448 L449 L45 L49-L60 L62-L68 L70-L75 L80-L88 L89000-L89004 L89009-L89014 L89019-L89024 L89029 L89100-L89104 L89109-L89114 L89119-L89124 L89129-L89134 L89139-L89144 L89149-L89154 L89159 L89200-L89204 L89209-L89214 L89219-L89224 L89229-L89304 L89309-L89314 L89319-L89324 L89329 L8940-L8945 L89500-L89504 L89509-L89514 L89519-L89524 L89529 L89600-L89604 L89609-L89614 L89619-L89629 L89810-L89814 L89819 L89890-L89894 L89899 L8990-L8995 L90-L93 L940-L945 L948 L949 L95 L97-L99
Back problems (new onset low back pain)	724	M432 M438X9 M4800 M4804-M4808 M532X7 M532X8 M533 M5380 M5384-M5388 M539 M5403-M5409 M5414-M5417 M543-M546 M5489 M549 M62830 M9922-M9929 M9932-M9939 M9942-M9949 M9952-M9959 M9962-M9969 M9972-M9979
Hypertension	401	I10 I160 I161 I169
Hyperlipidemia, lipid disorders	272	E7130 E7521 E7522 E7524 E753 E755 E756 E770 E771 E7841 E7849 E778-E786 E7870 E7879 E788 E789 E881 E882 E8889
Diabetes	249-250	E08-E11 E13
Depression	296.2 311, 309	F320-F325 F329 F431 F432 F438 F439 F930 F948
Anxiety	300	F341 F40 F41 F42 F422 F423 F428 F429 F44 F450-F452 F458 F459 F481 F488 F489 F6811 F6813 F688 F99 R452 R455 R456
Arthritis and localized joint syndromes	710-716	A1801 A1802 A5216 E08610 E08618 E09610 E09618 E106 E116 E136 M00-M02 M042 M048 M049 M05-M07 M080 M082 M083 M084 M088 M089 M11 M120 M121 M125 M128 M129 M13-M19 M32-M34 M350 M351 M352 M355 M358 M359 M36
Obesity	278	E65 E6601 E6609 E661 E662 E663 E668 E669 E670 E671 E672 E673 E678 E68
Asthma	493	J440 J441 J449 J4520 J4521 J4522 J4530 J4531 J4532 J4540 J4541 J4542 J4550 J4551 J4552 J45901 J45902 J45909 J45990 J45991 J45998
Symptoms, signs, and ill-defined conditions	780–799, except 7840 (7840 is used for headache)	B349 E035 E0781 E0852 E0952 E1052 E1152 E1352 E790 G4700 G4710 G4730 G479 G933 I7036 I7046 I7056 I7066 I7076 I7301 I96 K522 K5229 K5289 N23 N393 N394 O28 P09 R000 R002 R008 R009 R01 R03-R05 R0600-R0602 R0609 R061-R069 R07 R090 R092 R093 R0982 R0989 R10 R110 R1110 - R1112 R1114 R1115 R112 R12 R13-R23 R25 R260 R261 R2681 R2689 R269 R27 R290-R293 R295 R296 R298 R299 R30 R32-R35 R360 R369 R39 R400 R401 R4020 R40211 R40212 R40221 R40222 R40231 R40232 R40234 R403 R404 R410-R414 R4181 R4182 R4184 R4189 R419 R42 R43 R440 R442-R449 R450 R453 R454 R4583 R4584 R4586-R4589 R46 R47 R480-R482 R488 R489 R49 R50 R52-R57 R59-R64 R6521 R680 R681 R683 R688 R69-R71 R73-R79 R800 R801 R803 R808 R809 R81-R94 R97 R99 R828 R8281 R8289 R8299 R938

Table 5.C.12 *(continued)*

Condition	ICD-9 Codes[a]	ICD-10 Codes[b]
Upper respiratory conditions (not including asthma)	460–477	J00 J01 J028 J029 J038 J039 J04-J06 J20 J21 J30-J33 J342 J35-J37
Ischemic heart disease	413, 414	I201 I208 I209 I251 I253 I2541 I2542 I255 I256 I2570-I2573 I2575 I2576 I2579 I2581-I2584 I2589 I259
CHF	428	I50
Obstructive airway diseases Or COPD, Asthma	491	J41 J42 J44
Thyroid disorder	246	E034 E041 E070 E071 E0789 E079 E35

Source: American Medical Association. "ICD-10-CM: The Complete Official Codebook." 2015–2020.

[a] We include all ICD-9 codes that *start with* these codes. ICD-9 codes were used for Medicare billing prior to October 1, 2015. They were needed in this analysis to identify whether the beneficiary had the same diagnosis on any E&M service in the 24 months prior to the index claim.

[b] We include all ICD-10 codes that *start with* these codes. ICD-10 codes were used for Medicare billing starting October 1, 2015.

CHF = congestive heart failure; COPD =chronic obstructive pulmonary disease; GERD = Gastroesophageal reflux disease.

Table 5.C.13. Procedure codes used to identify E&M services

Category	CPT/HCPCS codes
Office- and non-office-based E&M codes	G0068-G0070, G0076-G0087, G0101, G0245-G0248, G0250, G0378-G0384, G0402, G0420, G0421, G0463, G0466-G0470, G0473, G0490, G2001-G2009, G2011, G2013-G2015, G2082, G2083, G9978-G9986, 0500F, 0502F, 0503F, 1000F, 2000F, 94002-94005, 94660, 94662, 95115, 95117, 99026, 99027, 99058, 99175, 99201-99205, 99211-99215, 99217-99226, 99231-99236, 99238, 99239, 99281-99285, 99288, 99291, 99292, 99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337, 99341-99345, 99347-99350, 99354-99357, 99366, 99367, 99381-99387, 99391-99397, 99401-99404, 99411, 99412, 99420, 99429, 99466-99469, 99471, 99472, 99475, 99476, 99480, 99485, 99600-99602, 99415, 99416, 99484, 99490, 99491, 99492-99494, 99497, 99498, G0438, and G0439
Telehealth codes	99421-99423, 99441-99444, G0406-G0408, G0425-G0427, G0508-G0509, G2010, G2012, G2061-G2063

Sources: American Medical Association. "CPT, Professional Edition." 2016–2020; American Medical Association. "HCPCS Level II, Professional Edition." 2016–2020.

ROS. This measure assesses the range of services a primary care physician provided to their Medicare patients by counting the number of the following types of services the physician provided: immunization administration, behavioral or mental health counseling, cryotherapy/skin excisions, joint injections, and treatment of minor lacerations.

We calculate this measure for each measurement year. For each CPC+ or comparison group primary care physician, we create five indicator variables, one for each type of service represented in the measure. The indicators for a physician are set to 1 if we identify one or more Medicare Part B claims with a date of service during the measurement year with the physician's NPI listed as the performing physician and at least one of the CPT codes listed in Table 5.C.14 for the respective type of service. The indicators are summed to create a final ROS score from 0 (physician did not provide any of the types of service) to 5 (physician provided all of the types of service) for each measurement year.

Table 5.C.14. Procedure codes used to identify select service types

Type of service	CPT/HCPCS codes
Immunization administration	90471, 90472, G0008, G0009
Behavioral or mental health counseling	90791, 90792, 90832-90834, 90836-90838, 90853, 99484, 99492-99494, G0502, G0503, G0504[a]
Treatment of minor lacerations	12001, 12002, 12004, 12005, 12011, 12013, 12014, 12020, 12021, 12031, 12032
Cryotherapy/skin excision	10060, 10061, 10160, 11100, 11101, 11102-11107[b], 11300-11303, 11305-11307, 11310-11312, 11400, 11401-11404, 11420-11422, 11440-11442, 17110, 17250
Joint injection	20550, 20551, 20600, 20605, 20610

Sources: American Medical Association. "CPT, Professional Edition." 2016–2020; American Medical Association. "HCPCS Level II, Professional Edition." 2016–2020.

[a] Behavioral or mental health counseling codes G0502, G0503, and G0504 were added for 2017, but then replaced by 99491-99494 in 2018.

[b] Cryotherapy/skin excision codes 11100 and 11101 were deleted in 2019 and replaced by six new codes (11102–11107) that are based on the thickness of the sample and the technique used for skin excision.

F. Other quality of care

We examined seven additional quality of care outcomes that are based on use of Medicare services. There are three discharge-level measures: unplanned 30-day readmissions, unplanned acute care following an acute hospital discharge, and unplanned acute care following a discharge from an ED. We also created three measures of hospice service use: percentage of beneficiaries using hospice service; days of hospice use for beneficiaries receiving hospice services; and days of hospice use for all beneficiaries. The seventh measure assesses the use of high-risk medications in the elderly. We describe these measures in more detail below.

Unplanned readmissions within 30 days of a hospital index discharge. For calculating the 30-day readmission rate, we used a slightly different time period definition than for the other measures. We looked at all eligible inpatient discharges during the last month of the previous year and the first 11 months of the current year,[63] and calculated the proportion of these index discharges that were followed by an unplanned hospitalization within 30 days of the discharge. An unplanned readmission is defined as any hospitalization that does not continue care (examples of planned admissions include recurring admissions for chemotherapy and planned admission for transplant surgery).

[63] We examine all index discharges during the last month of the previous year and the first 11 months of the current year to ensure that the relevant outcome "readmission within 30 days" is observed within the analysis period with adequate claims runout. One minor disadvantage is that, for the first intervention year, some readmissions are measured in the last month of the baseline (December 2016), before the CPC+ intervention began, which would dilute any observed effect on readmissions in Year 1. However, this factor affects only 1 out of 13 months (12 months of index discharges plus one additional month to observe 30 day readmissions post index discharge) of observed readmissions in Year 1, and should not discernibly change the Year 1 effect, especially because we do not expect the intervention to have sizable effects in Year 1. We considered the alternative of including index discharges over all 12 months of a calendar year. However with this approach, we would not be able to observe all possible 30-day readmissions without expanding the analysis period into the first month of the following year, which for the fifth year of CPC+ would include a month after the intervention ended. Also, it would lead to limited claims runout of only two months for that last month of readmissions in each measurement period.

For an index discharge to qualify for inclusion in the readmission measure, the beneficiary must (1) be enrolled in Medicare FFS Part A and not in a health maintenance organization (HMO) at the time of the index admission, (2) be enrolled in Medicare FFS Part A during the month following discharge, (3) be alive at discharge, and (4) not be discharged against medical advice. In addition, certain inpatient stays were excluded from the universe of index discharges, including discharges with lengths of stay longer than one year; stays at cancer hospitals exempt from the Prospective Payment System; and stays for psychiatric conditions, rehabilitation, or cancer. Our definition of this measure is based on the Yale readmission measure developed by the Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE 2020) that is used in the Hospital Readmission Reduction Program under Section 3025 of the Affordable Care Act.[64]

After we identify the index discharge and qualifying readmissions, we apply these beneficiary eligibility criteria to the readmission: (1) enrolled in Medicare Part B with Medicare as the primary payer in the month of the admission and the month following the admission and (2) enrolled in Medicare Parts A and B, not in an HMO, with Medicare as the primary payer in the month of the discharge. If beneficiaries did not meet these criteria, we did not include them in our readmission measure.

Although we analyze our main readmission outcome at the discharge level, we also conduct a sensitivity test examining the measure of unplanned readmission at the beneficiary level (for motivation and details, see Appendix 5.C). Unlike the discharge level outcome, all beneficiaries in the ITT sample are included in the beneficiary-level analysis. This binary measure takes the value 1 if the beneficiary had a qualifying readmission in the observation period (after applying the eligibility criteria, as explained above), and 0 otherwise.

Unplanned acute care. We developed two binary measures of unplanned acute care based on:

1. Percentage of index acute care hospital discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days.
2. Percentage of index ED (including observation stay) discharges that were followed by an unplanned acute care hospitalization or ED visit (including observation stays) within 30 days.

The purpose of these measures is to capture additional unplanned acute care use beyond the 30-day unplanned readmission measure.

To develop the first measure, we start with the set of index hospitalizations used to calculate the 30-day unplanned readmission measure for each measurement year. This is the denominator for the measure. Then, we identify ED discharges (including observation stays) that started within 30 days of the discharge date of the index hospitalization. If the index hospitalization had an unplanned hospital readmission, an ED visit, or an observation stay within 30 days following the

[64] Additional information about the Yale readmission measure is available at QualityNet, "Measure Methodology Reports: Readmissions Measures," https://www.qualitynet.org/dcs/ContentServer?cid=1219069855841&pagename=QnetPublic%2FPage%2FQnetTier4&c=Page.

index discharge date, we flag the index hospitalization as being followed by unplanned acute care use within 30 days.

To develop the second measure, we first identify all ED visits (including observation stays) with a discharge date in January through November of the measurement year and in December of the prior year. We combine the visits that begin on the same day into one event. We consider these the set of index ED discharges for the measure denominator. Next, we obtain the set of unplanned hospital stays developed for the 30-day unplanned readmission measure for the measurement year and identify those that have an admission date within 30 days of an index ED visit. Then we identify ED visits (including observation stays) that started within 30 days of one of the index ED visits. We flag index ED visits as being followed by unplanned acute care use if they had either an unplanned hospital stay or an ED visit (including observation stays) within 30 days of the index ED visit discharge date.

Any use of hospice services. This measure is the percentage of beneficiaries who received any hospice services in the year. Beneficiaries are identified as having hospice services if they have a hospice claim in the year.

Number of days of hospice use among beneficiaries who received any hospice service during the year. This measure is the number of days a beneficiary spent in hospice care in a given year including days that were reported on denied claims when these claims did not overlap with dates of service on approved claims. We include denied claims to comprehensively account for the services beneficiaries received. To identify the number days of hospice care, we sorted hospice claims by beneficiary identification number, from date, and through date. Next, we combined claims with overlapping dates of service into a single span of service. Then, we calculated the days in each span by calculating the difference between the through date and the from date on the span and adding one. Finally, for each beneficiary and month, we summed the days in the spans with through dates in the month.

Number of days of hospice use among all beneficiaries. This measure is the number of hospice days in the measurement year, regardless of whether a beneficiary received any hospice services.

Two or more high-risk prescriptions for medications in the same medication class. This measure approximates the Healthcare Effectiveness Data and Information Set (HEDIS®) High Risk Medications in the Elderly measure that is included in the Quality Payment Program (QPP). We used the 2020 specifications (HEDIS; available at https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2020_Measure_238_MIPSCQM.pdf.). It is defined as the percentage of beneficiaries age 65 and older who received two or more medications with a high risk designation within the same class. A lower rate indicates better performance.

The denominator includes beneficiaries who were: at least 65 years old at the end of the measurement year and continuously enrolled in Medicare Parts A, B, and D during the measurement year. The denominator excludes those who used hospice services in the measurement year. The numerator is based on year-specific value sets from the National Committee for Quality Assurance (NCQA) that contain National Drug Codes (NDC) that map the medication classes. Examples of "high-risk" medication classes include antispasmodics,

antithrombotics, and non-benzodiazepine hypnotics. Table 5.C.15 presents a list of all the medication classes, which can also be found in the QPP documentation. We did not require a clinician encounter for inclusion in the numerator. To align with the HEDIS specification, we did not report the rate of receipt of one high-risk medication as described in the QPP documentation. (The value sets are available at: https://www.ncqa.org/hedis/measures/.)

Table 5.C.15. High-risk medication drug classes

Anticholinergics, first-generation antihistamines	Endocrine system, sulfonylureas, long-duration
Anticholinergics, anti-Parkinson agents	Endocrine system, other
Antispasmodics	Pain medications, skeletal muscle relaxants
Antithrombotics	Pain medications, other
Cardiovascular, alpha agonists, central	Anti-infectives, other[a]
Cardiovascular, other	Nonbenzodiazepine hypnotics[b]
Central nervous system, antidepressants	Reserpine[c]
Central nervous system, barbiturates	Digoxin[c]
Central nervous system, vasodilators	Doxepin[c]
Central nervous system, other	
Endocrine system, estrogens with or without progestins; includes only oral and topical patch products	

Note: Unless otherwise noted, medications with any dose or duration in these classes are considered high risk.

[a] Medication with days-supply criteria.

[b] Medication with days-supply criteria prior to 2020, but considered high risk with any dose in 2020.

[c] Medication with average daily dose criteria.

G. Mortality

We constructed annual measures of mortality and days a beneficiary was alive for Medicare FFS beneficiaries attributed in the first quarter of the intervention:

- 12-month mortality: percentage who died within 12 months (by the end of PY 1)
- 24-month mortality: percentage who died within 24 months (by the end of PY 2)
- 36-month mortality: percentage who died within 36 months (by the end of PY 3)
- 48-month mortality: percentage who died within 48 months (by the end of PY 4)
- 12-month survival: fraction of days alive across 12 months (by the end of PY 1)
- 24-month survival: fraction of days alive across 24 months (by the end of PY 2)
- 36-month survival: fraction of days alive across 36 months (by the end of PY 3)
- 48-month survival: fraction of days alive across 48 months (by the end of PY 4)

5.C.2. Non-outcome claims-based measures

We quantify how participation in other initiatives differs between CPC+ and comparison practices and how this participation shifted from the baseline period to the first three program years of CPC+ for each group (Appendix 5.E). We discuss two broad types of CMS initiatives below: care management services and behavioral integration services.

Receipt of chronic care management, transitional care management, or other care management services. We used these three measures to examine the extent of receipt of each type of care management services as well as any care management services during the year by beneficiaries assigned to CPC+ and comparison practices. We identified beneficiaries with a claim in the carrier or outpatient file with one of the procedure codes in Table 5.C.14 as having received one of these management services. Comparable to the ambulatory visit specifications, we did not include add-on services in our algorithm. The CPT Editorial Panel instituted several procedure code updates during our analytic time period, so our specifications were updated to reflect codes as they were added, deleted, or replaced. We included new procedure codes as they were implemented or updated them when they were replaced. In 2020, we added HCPCS Codes G2064: Principal care management (physicians and non-physicians); and G2064: Principal care management (clinical staff). The last column of Table 5.C.14 shows the time period during which each procedure code was used. Although CPC+ practices cannot bill chronic care management services for attributed Medicare beneficiaries, we expect to observe a small proportion of CPC+ beneficiaries with such claims in our analysis sample based on intent-to-treat assignment rules, under which we retain beneficiaries even if they are no longer attributed to a CPC+ practice.

Receipt of general behavioral health integration and psychiatric collaborative care management. In January 2017, CMS introduced FFS Medicare Part B billing codes for Psychiatric Collaborative Care Management (CoCM) and General Behavioral Health Integration (BHI) (CMS 2019). CoCM enhances primary care through the addition of behavioral health care managers and psychiatric consultation, whereas BHI supports various integration models and

staffing configurations. We created three new indicators at the beneficiary-level for receipt of behavioral health care management services during the intervention years: (1) BHI, (2) psychiatric CoCM, and (3) psychiatric collaborative care model at an FQHC or RHC. These indicators are subsets of the existing chronic and other care management categories that we describe above and note in Table 5.C.16.

Table 5.C.16. Procedure codes for chronic care management, transitional care management, and other care management services

	CPT/HCPCS code	Description	Time period during which procedure code is included in measures
Chronic care management	99490	Chronic care management (20 minutes of clinical staff time)	2016–2020
	99491	Chronic care management (30 minutes of clinical staff time)	2019–2020
	99487	Complex chronic care management (60 minutes of clinical staff time)	2017–2020
	99484[a]	General behavioral health integration care management	2018–2020
	G0506	Chronic care management care planning	2017–2020
	G0507[a]	Care management services for behavioral health conditions	2017 (deleted in 2018 and replaced with 99484)
	99358	Prolonged (<75 minutes) of non-face-to-face E&M service before and/or after direct patient care	2016–2020
Transitional care management	99495	Transitional care management for patients discharged to community from an inpatient setting; moderate complexity of medical decision making	2016–2020
	99496	Transitional care management for patients discharged to community from an inpatient setting; high complexity of medical decision making	2016–2020
Other care management	G0181	Home health supervision of at least 30 minutes	2016–2020
	G0182	Hospice health supervision of at least 30 minutes	2016–2020
	G0502[b]	Initial psychiatric collaborative care management, first 70 minutes	2017 (Deleted in 2018 and replaced with 99492)
	G0503[b]	Subsequent psychiatric collaborative care management, first 60 minutes	2017 (Deleted in 2018 and replaced with 99493)
	G0504[b]	Initial or subsequent psychiatric collaborative care management, additional 30 minutes	2017 (Deleted in 2018 and replaced with 99494)
	G0505	Cognition and functional assessment	2017 (Deleted in 2018 and replaced with 99483)
	G0511	General care management at an FQHC or RHC	2018–2020
	G0512[c]	Psychiatric collaborative care model at an FQHC or RHC	2018–2020
	G2064	Principal care management (physicians and non-physicians)- covers services for patients with only one complex chronic condition that requires management by a specialist	2020
	G2065	Principal care management (clinical staff)- covers services for patients with only one complex chronic condition that requires management by a specialist	2020
	99483	Cognitive assessment	2018–2020
	99492[b]	Initial psychiatric collaborative care management	2018–2020
	99493, 99494[b]	Subsequent psychiatric collaborative care management	2018–2020
	99497	Advance care planning	2016–2020

Sources: American Medical Association. “CPT, Professional Edition.” 2016–2020; American Medical Association. “HCPCS Level II, Professional Edition.” 2016–2020.

Table 5.C.16 ***(continued)***

Note: CPT Codes 99489 (Additional 30 minutes of clinical staff time for chronic care management) and 99359 (Additional 30 minutes of prolonged non-face-to-face E&M service before and/or after direct patient care) were used to identify CCM services for our first annual report but were not used to identify CCM services in subsequent reports.

[a] General Behavioral Health Integration (BHI)

[b] Psychiatric Collaborative Care Management (CoCM)

[c] Psychiatric collaborative care model at an FQHC or RHC

CCM = chronic care management; CPT = Current Procedural Terminology; E&M = Evaluation and Management; FQHC = Federally Qualified Health Center; HCPCS = Health Care Common Procedure Coding System; OCM = other care management; RHC = Rural Health Center; TCM = transitional care management.

5.C.3. Claims-based control variables

In this section, we discuss the construction of claims-based control variables we used in our regression analysis that all center on beneficiary health and chronic conditions.

Three beneficiary-level claims-based control variables were derived from the hierarchical condition category (HCC) software: (1) an HCC score, which is a measure of risk for subsequent expenditures; (2) an indicator for "new enrollees"; and (3) indicators for 21 chronic condition categories. We also created an indicator for **Alzheimer's disease or dementia based on the Chronic Conditions Warehouse (CCW) algorithm**. We describe these measures below.

Hierarchical condition category score. We controlled for HCC score in our regressions to account for variation in beneficiaries' health status, or their level of risk for Medicare spending (Pope et al. 2004, 2011). We controlled for the baseline HCC score (calculated using 2015 claims for beneficiaries attributed to practices that started in 2017) for observations in the baseline period. To avoid endogeneity issues, we controlled for the score at the start of the intervention (calculated using 2016 claims for beneficiaries attributed to practices that started in 2017) for observations during the entire intervention period (i.e., we did not update the HCC score during the intervention period with claims data drawn from the intervention period). We also include a binary control variable in our regression analysis that indicates whether the HCC score was calculated using only demographic information.[65]

We calculated both the baseline and intervention period HCC scores using CMS's HCC score software and algorithm, based on information from Medicare claims and enrollment data. We deviated from the exact approach CMS uses in a few ways to adapt the CMS algorithm for the purpose of the impact analysis. For instance, to avoid endogeneity concerns, we used information on dual status, long-term institutionalization (LTI), and ESRD status from the prior year instead of the year for which the HCC score was being calculated. Also, we adopted a more nuanced approach to assigning the new enrollee versus the community score to beneficiaries with less than 12 months of FFS enrollment during the base year, as described in Step 5 below.

Specifically, we used the following approach:

1. To calculate HCC scores, we continued to use Version 22 2017 HCC model software,[66] which has greater predictive accuracy than earlier versions. We also used the Version 21 2017 ESRD model software for beneficiaries with ESRD.

2. To calculate HCC scores, we used a 12-month lookback for Medicare claims to obtain diagnosis information. For instance, to calculate the 2017 HCC score, we used Medicare claims during 2016. For beneficiaries that are newly attributed after 2017, we still use their 2016 Medicare claims (if they exist) to calculate their 2017 HCC score.

[65] HCC scores are calculated on the basis of demographic characteristics only when claims data are not observed for a beneficiary and may not reflect the actual risk of the beneficiary. This situation generally happens when the beneficiary is new to Medicare FFS.

[66] We have incorporated the 2018–2020 ICD-10 codes into the Version 22 2017 software.

3. The HCC algorithm also uses information on demographics, reason for Medicare eligibility, new enrollee status, dual eligibility status (with the latest version of the model distinguishing between beneficiaries who have full versus partial dual eligibility status), long-term nursing home care, kidney transplant, and dialysis status. To estimate and assign HCC scores for any year, we used information on these attributes from the prior year, with the exception of demographics and reason for Medicare eligibility, which were from the current year. For example, to calculate the 2017 HCC score, we used the following beneficiary information:

   - Demographics from 2017
   - Medicare eligibility (eligible due to age or disability) from 2017
   - New enrollee status from 2016 (a beneficiary with less than six months of Medicare FFS enrollment during the year was flagged as a new enrollee)
   - Dual eligibility status (full, partial, or nondual) during the last three months of 2016
   - ESRD status during the last three months of 2016
   - LTI status during a 120-day period ending on December 31, 2016
   - The number of months since a kidney transplant, looking back from January 1, 2017
   - Whether the transplant was successful or the beneficiary was on dialysis

4. The HCC algorithm estimates the following separate models: (1) ESRD (further differentiating by dialysis status and time since kidney transplant), (2) LTI, (3) community (further differentiating by dual status and aged versus disabled status), and (4) new enrollee. These models include different covariates and interaction terms, and therefore lead to multiple values of the HCC scores for each beneficiary. For instance, the new enrollee model is estimated with covariates only for demographics and Medicare eligibility information, without any covariates for claims-based diagnoses. Thus, for the 2017 HCC score, a beneficiary would have multiple values with one score from each model.

5. After estimating the four HCC models, we selected one HCC score for each beneficiary, following CMS's approach to determine which model's score was appropriate for the beneficiary. For example, we assigned a specific value of the 2017 HCC score to a beneficiary, by progressively checking the criteria in the following order:

   - We assigned the value of the ESRD score to a beneficiary for the 2017 HCC score if the beneficiary had ESRD anytime during the last three months of 2016 (the ESRD score could further vary or could come from a different ESRD submodel, depending on length of time since a successful kidney transplant, dialysis status, new enrollee status, and age).
     - We rescaled the risk scores for ESRD and post-kidney transplant beneficiaries to account for the fact that their average costs differ from the average costs for the overall FFS population. For ESRD beneficiaries on dialysis, their 2016 and 2017 HCC scores were multiplied by factors of 8.146 and 8.227, respectively. For

beneficiaries with functioning grafts, multiplication factors were 0.866 (2016 HCC score) and 0.875 (2017 score).[67]

- If a beneficiary did not have ESRD and met the criteria for LTI during the 120-day period ending on December 31, 2016, we assigned the value of the institutional or LTI score for 2017.
- If a beneficiary did not meet the criteria for either the ESRD or LTI score, and:
  - Had less than six months of Medicare FFS enrollment during 2016, we assigned the new enrollee score for 2017. (Note that this approach is used for baseline scores as well.)
  - Had 10 or more months of Medicare FFS enrollment during 2016, we assigned the community score for 2017. The community score varied or was obtained from a different submodel, depending on dual status (full, partial, or nondual) during the last three months of 2016, and aged versus disabled status.
  - Had six to nine months of Medicare FFS enrollment during 2016, we again assigned the community score for 2017 (varying as above by dual and aged or disabled status) but adjusted that score upward or inflated it by 25 percent. We used this approach to account for missing information on Medicare claims for three to six months in 2016, and therefore, the limited information on diagnoses available for such beneficiaries.

6. Finally, we used CMS's official normalization factors for 2016 and 2017 HCC scores to calculate a normalized risk score for each beneficiary. Specifically, the normalized risk score for 2016 (or 2017) is equal to the raw 2016 (or 2017) risk score, calculated using the approach laid out above, divided by the normalization factor for that year. The normalization factors account for changes in coding practice as well as in population demographics between the year an HCC model was calibrated and the year for which we calculated the HCC score.

Indicator for whether a beneficiary was assigned a new enrollee score. Our regressions also controlled for whether a beneficiary was assigned a new enrollee score in the baseline or intervention period. The other types of scores (community, LTI, ESRD, etc.) are based on the beneficiary's actual claims history, but the new enrollee score (which is assigned to beneficiaries with less than six months of FFS eligibility during the lookback period) is only a proxy for the beneficiary's actual risk, because it is based only on the beneficiary's demographic characteristics and reason for Medicare entitlement. A beneficiary that is first attributed after 2017 and is assigned a new enrollee score (based on having less than six months of claims or no claims in 2016) will retain that same score throughout the entire intervention period. The scores are not updated, because they could be affected by the care that the beneficiary receives during the intervention.

[67] The resource for the ESRD rescaling factors is the CCW Geographic Variation Database (GVDB) V5 manual.

Chronic condition indicators based on individual or combined HCCs. In addition to HCC scores, our regressions also controlled for HCCs. The HCC models produce the HCCs as part of generating the HCC score by using diagnosis information in Medicare claims (Pope et al. 2004, 2011). The models produce a total of 87 HCCs (79 from the V22 HCC model and an additional 8 from the ESRD model). Based on investigations for our first annual report, we had identified 21 HCCs (Table 5.C.17) to include as control variables to adjust for chronic conditions in our regressions, in three steps outlined below. We continued to use the same HCCs in this report, creating baseline and intervention period versions. The baseline measures are based on diagnoses in the prior year or the pre-baseline year (2015). The measures used during the intervention period (Years 1 through 3) are based on diagnoses in the baseline year (2016). Note that a beneficiary will never have a condition in the intervention period if the beneficiary has no claims in 2016. The indicator for the new enrollee score enables us to distinguish between true zeroes on these conditions (beneficiaries that had claims, but did not have the condition) versus those that do not show up as having the condition because they did not have claims in 2016.

Step 1. We narrowed the pool to 38 HCCs that met at least one of the following criteria:

- Had a relatively high prevalence among beneficiaries in our sample (4 percent and above).
- Had higher than average relative factors (greater than or equal to 1) from the HCC models, implying that they were important predictors of Medicare expenditures.
- Showed a noticeable change in prevalence rates between the baseline year (2016) and the follow-up year (2017), among beneficiaries in the yearly samples (greater than or equal to 0.4 percentage points in the CPC+ group or the comparison group).
- Showed a noticeable difference in prevalence rates between CPC+ and comparison beneficiaries in the sample (greater than or equal to 0.2 percentage points).

Step 2. We ran difference-in-differences regressions for Medicare expenditures without fees, using one year of baseline period data and one year of follow-up period data, and including all 38 HCCs, separately for Track 1 and Track 2 practices.

Step 3. Based on the magnitude and significance of the coefficient estimate for each HCC in these regressions, and their overall prevalence in our sample, we selected 21 categories as regression controls (Table 5.C.17). Eleven of these HCCs were individual HCCs denoting a specific condition, and the 10 others were combinations of one or more HCCs. We combined certain HCCs with high or statistically significant coefficient estimates if their individual rates of prevalence were low and they belonged to the same broad family of conditions.

Table 5.C.17. List of hierarchical condition categories used as chronic condition controls

Hierarchical condition category	Description
HCC 8	Metastatic Cancer and Acute Leukemia
HCC 18	Diabetes with Chronic Complications
HCC 21	Protein-Calorie Malnutrition
HCC 22	Morbid Obesity
HCC 23	Other Significant Endocrine and Metabolic Disorders
HCC 85	Congestive Heart Failure
HCC 96	Specified Heart Arrhythmias
HCC 106	Atherosclerosis of the Extremities with Ulceration or Gangrene
HCC 111	Chronic Obstructive Pulmonary Disease
HCC 173	Traumatic Amputations and Complications
HCC 186	Major Organ Transplant or Replacement Status
HCC 40 or 47	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease or Disorders of Immunity
HCC 46 or 48	Severe Hematological Disorders, or Coagulation Defects and Other Specified Hematological Disorders
HCC 54 or 55	Drug/Alcohol Psychosis or Dependence
HCC 57 or 58	Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders
HCC 70 or 71	Quadriplegia or Paraplegia
HCC 80 or 82	Coma, Brain Compression/Anoxic Damage or Respirator Dependence/Tracheostomy Status
HCC 86, 87, or 88	Acute Myocardial Infarction, Unstable Angina and Other Acute Ischemic Heart Disease, or Angina Pectoris
HCC 99 or 100	Cerebral Hemorrhage, or Ischemic or Unspecified Stroke
HCC 107 or 108	Vascular Disease, with Complications
HCC 157 or 158	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone; or of Skin with Full Thickness Skin Loss

Source: Centers for Medicare and Medicaid Services. "CMS-HCC Risk Adjustment Model." 2017–2018. Available at https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.

Indicator for presence of Alzheimer's disease or dementia based on the CCW algorithm. Similar to the HCCs described above, we constructed a CCW indicator for Alzheimer's disease or dementia to adjust for this condition in our regressions. (This indicator is also used to identify high-risk beneficiaries in risk Tier 5, as described in Chapter 5 in Peikes et al. 2021.) We used this CCW indicator instead of HCCs for Alzheimer's disease and dementia from the HCC model to ensure consistency with CMS's approach for identifying high-risk, Tier 5 beneficiaries in Track 2 of CPC+. We created annual indicators based on the CCW algorithm, which uses a three-year lookback period to identify these diagnoses. For example, our baseline (2016) indicator used claims from January 1, 2013, through December 31, 2015, and our indicator for Alzheimer's and dementia at the start of the intervention period (2017) used claims from January 1, 2014, through December 31, 2016.

The CCW algorithm for defining this indicator requires a diagnosis code from Table 5.C.18 in any position on at least one inpatient, skilled nursing facility, home health, outpatient, or carrier claim during the three-year lookback period.

Table 5.C.18. Diagnosis codes used to identify Alzheimer's disease or dementia

ICD-9 diagnosis codes	ICD-10 diagnosis codes
331.0, 331.11, 331.19, 331.2, 331.7, 290.0, 290.10, 290.11, 290.12, 290.13, 290.20, 290.21, 290.3, 290.40, 290.41, 290.42, 290.43, 294.0, 294.10, 294.11, 294.20, 294.21, 294.8, 797	F01.50, F01.51, F02.80, F02.81, F03.90, F03.91, F04, G13.8, F05, F06.1, F06.8, G30.0, G30.1, G30.8, G30.9, G31.1, G31.2, G31.01, G31.09, G94, R41.81, R54

Source: Centers for Medicare & Medicaid Services. "Chronic Conditions Data Warehouse (CCW)." 2016–2020. Available at https://www2.ccwdata.org/web/guest/condition-categories.

5.C.4. Non-claims-based control variables

For beneficiary-level analyses, we controlled for beneficiaries' demographics (age, race, and gender) and original reason for Medicare eligibility (age, disability, or ESRD) in our regression models, based on information in the Medicare enrollment database. We calculated age as of January 1 of the baseline year for the baseline observations (2016), and as of January 1 of the first intervention year (2017) for observations in the intervention period. We describe the exact age and race categories used in our regressions in Appendix 5.C.

We also controlled for dual eligibility status, based on information obtained from the Master Beneficiary Summary File (MBSF). Specifically, we used the DUAL_STATUS_CD variable in the MBSF during the last three months of the pre-baseline (2015) and baseline (2016) years to define dual status for the baseline and intervention periods, respectively. We flagged a beneficiary as dually eligible if this variable indicated either full or partial dually eligible status during any of those three months.[68] For beneficiaries who enrolled in Medicare after the three months prior to the measurement period (i.e., the last three months of 2015 or the last three months of 2016), we assigned the non-dual status for the corresponding measurement period by default, because they did not have a dual status in the MBSF before their enrollment. For example, if a beneficiary enrolled in Medicare in 2016, then we assigned the non-dual status for the baseline period, because the beneficiary did not have a dual status in the MBSF during the last three months of 2015. Similarly, if a beneficiary enrolled in Medicare in 2018, then we assigned the non-dual status for all intervention periods, because the beneficiary did not have a dual status in the MBSF during the last three months of 2016. Consistent with our approach for other covariates, we do not update the dual status during a measurement period, because it could be affected by the care that the beneficiary receives during the intervention.

For the two comprehensiveness of care measures, which are estimated at the NPI level, we controlled for the NPI's age, gender, and primary specialty, extracted from the MD-PPAS. We calculated the NPI's age as of January 1 of the baseline year for the baseline observations (2016) and as of January 1 of the first intervention year (2017) for observations in the intervention period. We used the NPI's gender and primary specialty defined in 2016 for baseline observations and those defined in 2017 for observations in the intervention periods.

[68] We used dual eligibility status in the three months *prior to the measurement period* (baseline or first intervention year) as a control variable to avoid endogeneity concerns with using concurrent values of time-varying beneficiary characteristics. Using the *last three months* before the start of the measurement period for outcomes gives us the closest approximation to dual status during the measurement period. This approach differs from CMS's dual status specification for payment purposes, in which concurrent month-by-month dual status is used to determine the appropriate risk score in the month.

5.D. Implications of COVID-19 for the CPC+ impact evaluation

The 2019 Coronavirus (COVID-19) pandemic could introduce bias into our impact estimates for the CPC+ evaluation if COVID-19 differentially affected outcomes for CPC+ and comparison regions. In this Appendix, we evaluate the likelihood that COVID-19 biased impact estimates during Program Year (PY) 4 and describe the approaches we considered to mitigate this potential source of bias. We first introduce the motivation and research questions for the analysis (Section 1). We then report the effects of COVID-19 in CPC+ and comparison regions, including the direct effects of COVID-19 on the prevalence of diagnoses and excess deaths (Section 2) as well as the total effects of COVID-19 on health care utilization and Medicare expenditures (Section 3). We next describe approaches we considered to account for differences in the CPC+ and comparison regions due to COVID-19 in our impact evaluation (Section 4). Finally, we discuss the key takeaways from the analysis and their implications for the CPC+ evaluation (Section 5). We include additional results and methodological details for this analysis in supplemental Sections 1–5.

5.D.1. Introduction

The CPC+ impact evaluation relies on comparison practices selected from "external" regions—here defined as states or contiguous counties that were not eligible to participate in CPC+. These regions could have experienced effects of the COVID-19 pandemic that were different than those experienced by CPC+ regions. In 2020, the timing and magnitude of the pandemic differed considerably by region (Oster et al. 2020), leading to concerns that COVID-19 could introduce bias into the CPC+ impact evaluation.

The goal of this Appendix is to report our assessment as to whether or not COVID-19 differentially affected the change in outcomes from 2019 to 2020 for the CPC+ and comparison regions. This helps us evaluate the likelihood that COVID-19 biased impact estimates for the CPC+ evaluation, and, if so, in what direction. Our analytical approach for the CPC+ impact evaluation for the fourth annual report was based, in part, on the findings from this analysis. The US first identified cases of COVID-19 in early 2020, thus we are treating 2019 as "pre-COVID-19" and 2020 as "post-COVID-19." The fourth annual report focuses on impact estimates from PY 4, which corresponds to 2020, therefore the objective of this Appendix is to assess whether outcomes in 2020 differed from expected trends had the pandemic not occurred. To accomplish this objective, we compared outcomes in 2020 to 2019, where 2019 provides a "baseline" to check for larger-than-expected divergence in trends in 2020 due to COVID-19.[69]

In this Appendix, we present results from analyses of three different populations: (1) the full Medicare fee-for-service (FFS) population living in CPC+ and comparison regions, (2) the intent-to-treat (ITT) CPC+ impact analysis sample, and (3) nonparticipating practices located in

[69] These analyses (and, therefore, our recommended approach for the CPC+ fourth annual report impact evaluation) were not based on actual CPC+ impact estimates for 2020, to avoid any subconscious biases towards approaches that show favorable impacts.

CPC+ regions and unselected practices located in comparison regions.[70] We use the full Medicare FFS population in analyses that calculate excess death rates, which require a large, stable denominator,[71] and analyses that use Medicare data that are already aggregated at the county level. Since we are primarily interested in the effects of COVID-19 on the ITT analysis sample, we use that sample for several analyses in this Appendix; however, we were concerned about the ability to distinguish between the effects of COVID-19 and the effects of CPC+ for some health care utilization outcomes. Because of this concern, we also examine differences in health care utilization for unselected practices in CPC+ and comparison regions, which should not be directly affected by CPC+. We assumed that COVID-19 similarly affected both selected and unselected practices in the same regions, and our findings presented later in this Appendix support this assumption.

We first examined the direct effects of COVID-19, as well as overall changes in health care utilization resulting from a combination of direct and indirect effects. We next measured direct effects by examining the prevalence of COVID-19 diagnoses in Medicare FFS claims and excess deaths due to the pandemic. Indirect effects refer to impacts caused by behavioral response to the COVID-19 pandemic, such as health care avoidance in response to rising COVID-19 cases. Two regions with the same direct effect of COVID-19 could experience different behavioral responses, for example, due to differences in the timing of when the COVID-19 caseload peaked in each region or differences in restrictions imposed by state or local governments. Also, the direction and magnitude of direct and indirect effects could differ within the same region, for example, an increase in COVID-19-related hospitalizations and deaths could drive down utilization of Medicare services due to Medicare beneficiaries avoiding or delaying care and hospitals suspending elective surgeries. Therefore, to understand how COVID-19 could affect the CPC+ impact evaluation, it is important to examine the total effect of the pandemic, or the combination of direct and indirect effects, as captured by net changes in health care utilization. We do this by examining changes in key outcomes of the CPC+ impact evaluation (expenditures for Medicare Part A and B services without CMS's enhanced payments for CPC+ and the Medicare Shared Savings Program [SSP], and all-cause hospitalizations and outpatient emergency department [ED] visits) between 2019 and 2020.

We then assess two approaches to account for any potential bias of COVID-19 on the impact estimates: (1) adding COVID-19-related regional variables to the difference-in-differences model (the approach we proceeded with for the fourth annual report impact evaluation) and (2) implementing a triple-differences approach that nets out regional differences using data from unselected practices. We conclude by summarizing key takeaways from our analysis on the effects of COVID-19.

[70] We refer to nonparticipating practices in CPC+ regions and practices not included in the final comparison group from the comparison regions collectively as unselected practices in this Appendix. For brevity, we also refer to these same practices as non-CPC+ and non-comparison practices in tables and figures.

[71] The Medicare FFS population is larger than the ITT analysis sample, allowing us to calculate more stable regional estimates of excess deaths due to COVID-19.

5.D.2. Direct effects of COVID-19 on prevalence of diagnoses and excess deaths

The findings on the direct effects of COVID-19 suggest that the prevalence of COVID-19 cases and the overall numbers of excess deaths were similar in CPC+ and comparison regions in 2020, although CPC+ regions experienced more excess deaths early in the pandemic and had fewer excess deaths later in the year, reflecting the influence of the CPC+ New Jersey region's early pandemic experience.

A. COVID-19-related diagnoses

We estimated the prevalence of COVID-19-related diagnoses (see text box below for definition) among CPC+ and comparison beneficiaries as well as beneficiaries attributed to unselected practices in both types of regions (see Figure 5.D.i in Supplement 1 for the regional distribution of CPC+ and comparison practices). Using unselected practices allowed us to look at regional differences among beneficiaries who are not attributed to practices in the evaluation, leading to estimates that are not affected by CPC+.

Key findings from our analysis of COVID-19-related diagnoses are as follows:

- Over the course of 2020, around 7 percent of CPC+ and comparison beneficiaries and 8 percent of beneficiaries attributed to unselected practices in CPC+ and comparison regions had a Medicare Part A or B claim with a COVID-19-related diagnosis in each track, with around 1 percent of beneficiaries diagnosed on average each month from March through December 2020 (Table 5.D.1).[72]
- Beneficiaries with a COVID-19-related diagnosis in the CPC+ and comparison groups were similar on characteristics such as age, race, original reason for Medicare entitlement, and chronic conditions (see Table 5.D.i in Supplement 1). This was also true when comparing beneficiaries with a COVID-19-related diagnosis in unselected practices in CPC+ and comparison regions.
- CPC+ practices (and nonparticipating practices in CPC+ regions) had somewhat more beneficiaries diagnosed early in the pandemic (in April) and somewhat fewer diagnosed later in the pandemic (July onward) (see Figure 5.D.ii in Supplement 1), relative to practices in comparison regions. This pattern reflects how the first wave of the pandemic unfolded with an early spike in cases in the CPC+ New Jersey region, in particular.
- In 2020, the number of claims, rates of outpatient ED visits and hospitalizations, and inpatient expenditures with a COVID-19-related diagnosis were lower among beneficiaries in both selected and unselected practices in CPC+ regions relative to their respective counterparts in comparison regions (Table 5.D.1).

[72] Some beneficiaries had a COVID-19-related diagnosis during multiple months in 2020, which is why the cumulative percentage of beneficiaries who had a COVID-19-related diagnosis between March and December 2020 is 7 percent and not 10 percent (1 percent multiplied by 10 months).

Closer look: COVID-19-related diagnoses

COVID-19-related diagnoses include:

- COVID-19 diagnoses, identified by searching all primary and secondary diagnoses for the ICD-10 code B9729 (other coronavirus) before April 1, 2020, and U071 (2019 Novel Coronavirus) from April 1, 2020, onwards
- Respiratory conditions related to COVID-19, that is, claims with primary and secondary diagnoses for any of the following
  - Viral pneumonia (J1289)
  - Bronchitis – acute (J208) or unspecified (J40)
  - Lower respiratory infection – specified (J988) or unspecified (J22)
  - Acute respiratory distress syndrome (J80)

We included both COVID-19 and COVID-19-related respiratory diagnoses to identify all cases that might have been caused by COVID-19, including cases misdiagnosed early in the pandemic. Results were similar using a narrower definition of strictly COVID-19 diagnoses.

Source: Bohl and Roozeboom-Baker (2020).

The differences in the prevalence of COVID-19-related diagnoses between the CPC+ and comparison group were very similar in magnitude to the differences between unselected practices in the CPC+ and comparison regions (Table 5.D.1). For example, Track 1 CPC+ practices had 0.03 percent fewer beneficiaries diagnosed each month relative to comparison practices, and nonparticipating practices in CPC+ regions had 0.04 percent fewer beneficiaries diagnosed each month relative to unselected practices in comparison regions. Although most of the observed differences in Table 5.D.2 are statistically significant, the magnitudes of those differences are relatively small. For instance, the difference of 1.1 acute hospitalizations with a COVID-19-related diagnosis per 1,000 beneficiaries per year for Track 1 CPC+ practices is less than half a percent of all-cause acute hospitalizations in the ITT analysis sample in 2020. The similarity of findings among selected and unselected practices in the CPC+ and comparison regions suggests that, by examining outcomes among unselected practices, we are likely to accurately capture differential regional effects of the pandemic without including any effects of CPC+.

Table 5.D.1. COVID-19-related diagnoses were lower among beneficiaries in both CPC+ practices and nonparticipating practices in CPC+ regions relative to their respective counterparts in comparison regions

	Track 1, Unadjusted means				Track 1, Differences (SE)		Track 2, Unadjusted means				Track 2, Differences (SE)	
	CPC+	Comparison	Non-CPC+	Non-comparison	CPC+ vs. comparison	Non-CPC+ vs. non-comparison	CPC+	Comparison	Non-CPC+	Non-comparison	CPC+ vs. comparison	Non-CPC+ vs. non-comparison
Beneficiary claims with COVID-19-related diagnosis (percentage of beneficiaries with a claim each month)												
March–December 2020	0.97%	1.00%	1.13%	1.17%	-0.03 p.p. (0.02 p.p.)	-0.04 p.p.** (0.02 p.p.)	0.93%	0.98%	1.08%	1.14%	-0.05 p.p. (0.03 p.p.)	-0.06 p.p.*** (0.02 p.p.)
Outpatient ED visits, including observation stays, with COVID-19- related diagnosis (per 1,000 beneficiaries per year)												
March–December 2020	10.0	11.5	11.9	13.4	-1.5*** (0.3)	-1.4*** (0.3)	10.1	11.2	12.3	13.5	-1.2*** (0.4)	-1.2*** (0.3)
Acute hospitalizations with COVID-19- related diagnosis (per 1,000 beneficiaries per year)												
March–December 2020	18.7	19.8	22.7	23.2	-1.1** (0.4)	-0.5 (0.4)	18.3	19.5	22.0	22.8	-1.2** (0.6)	-0.7* (0.4)
Medicare inpatient expenditures for COVID-19- related diagnosis (per beneficiary per month)												
March–December 2020	$32	$36	$40	$44	-$3.7*** ($0.9)	-$3.4*** ($0.8)	$32	$35	$39	$42	-$3.5*** ($1.1)	-$3.4*** ($0.8)
Unweighted sample sizes												
Number of practices	1,373	5,242	8,646	21,091			1,515	3,783	7,970	20,517		
Number of beneficiaries	1,029,778	3,565,556	2,454,119	7,163,311			1,258,740	3,022,973	2,152,230	6,942,317		

Source: Mathematica's analysis of Medicare claims data from January through December 2020.

Note: COVID-19-related diagnoses include COVID-19 diagnoses and respiratory conditions related to COVID-19 including viral pneumonia, acute bronchitis, lower respiratory infection, and acute respiratory distress syndrome. See Bohl and Roozeboom-Baker (2020) for details. Differences in the table are from time-series models run at the practice-month-year level that did not adjust for beneficiary or practice characteristics. For CPC+ practices, observations are weighted by the number of Medicare FFS beneficiaries assigned to the practice during the month and year. For comparison practices, the weight is a product of the number of assigned beneficiaries and the matching weight. For non-CPC+ and non-comparison practices, we used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; HRR = hospital referral region; p.p. = percentage points; SE = standard error.

B. Excess deaths

We estimated excess deaths as the difference between observed deaths in each month from March through December 2020 and predicted deaths during those same months if COVID-19 had not occurred. We used enrollment data for all Medicare FFS beneficiaries living in CPC+ and comparison regions to identify historic trends in deaths between 2016 and 2019 and then projected these trends out to months in 2020 to estimate predicted deaths if COVID-19 had not occurred. This approach is consistent with methods to calculate excess deaths used in the recent COVID-19 literature (Polyakova et al. 2021). For calculating excess deaths, we used observations at the state and hospital referral region (HRR), month, year, age group, race, and sex levels. Each observation was weighted based on (1) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that state-HRR, by track; (2) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that age-race-sex cell, by track; and (3) the matching weights of comparison group practices in a state-HRR, by track. A detailed description of our methods for estimating excess deaths is available in Supplement 2.

Key findings from our analysis of excess deaths are as follows:

- CPC+ and comparison regions had similar average excess deaths during March through December 2020 (Table 5.D.2), with deaths in CPC+ and comparison regions both increasing by 19 percent when weighted to represent Track 1 practices and by 18 percent when weighted to represent Track 2 practices.
- Across 2020, CPC+ regions had 0.001 fewer deaths per 10,000 beneficiaries per month than comparison regions in analyses weighted to represent Track 1 practices and 0.1 fewer deaths per 10,000 beneficiaries per month in analyses weighted to represent Track 2 practices, and these differences were not statistically distinguishable from zero.
- Although there were no differences in excess deaths averaged across the year, CPC+ regions had greater increases in deaths in April 2020 and smaller increases in deaths during July and August 2020 relative to comparison regions, reflecting the geographic spreading of the COVID-19 pandemic.

Differences in timing of excess deaths are notable because they could have initiated differential responses to the pandemic that differentially affect the CPC+ evaluation outcomes, which we explore in later sections on indirect effects of the pandemic. This difference in timing of excess deaths was particularly pronounced among regions weighted to represent Track 1 practices (see Figure 5.D.iii in Supplement 2) and appear to be driven—at least in part—by CPC+ practices in New Jersey. In later sections, we explore using regional excess deaths as a control variable to account for these differences (see Supplement 3 for a description of methods we used to develop an excess deaths regional control variable).

Table 5.D.2. Excess deaths in 2020 were similar among Medicare FFS beneficiaries in CPC+ and comparison regions[a]

Medicare FFS beneficiaries weighted to represent	Average excess deaths in March–December 2020 relative to historic trends in deaths per 10,000 beneficiaries per month			
	CPC+ regions[b] (% change from historic trends[a])	Comparison regions[b] (% change from historic trends[a])	Difference	90% confidence interval
Track 1	6.7 (19%)	6.7 (19%)	-0.001	(-0.9, 0.9)
Track 2	6.3 (18%)	6.4 (18%)	-0.1	(-1.0, 0.8)

Source: Mathematica's analysis of Medicare enrollment data from January 2016 through December 2020

Note: Excess deaths are the difference between observed deaths in March through December 2020 and predicted deaths if COVID-19 had not occurred. Predicted deaths are based on models that are regression-adjusted for the distribution of age, race, and sex in the region. The models use data from 2016 through 2019 and project trends out through 2020 to predict deaths if the COVID-19 pandemic had not occurred. For calculating excess deaths, we used observations at the state and HRR, month, year, age group, race, and sex levels. Each observation was weighted based on (1) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that state-HRR, by track; (2) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that age-race-sex cell, by track; and (3) the matching weights of comparison group practices in a state-HRR, by track. For a detailed description of methods, see Supplement 2.

[a] To calculate these percentages, we divided the excess deaths in the region by the predicted deaths if COVID-19 had not occurred. Predicted deaths are based on regression models using data from 2016 through 2019.
[b] Regions defined as the combination of state and HRR.
CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; HRR = hospital referral region; ITT = intent to treat.

5.D.3. Total effects of COVID-19 on health care utilization and Medicare expenditures

We examined total effects of COVID-19, that is the combination of direct and indirect effects, by measuring changes in key outcomes of the CPC+ impact evaluation (Medicare Part A and B expenditures, all-cause hospitalizations, and all-cause outpatient ED visits) between 2019 and 2020. To approximate regional changes due to the pandemic without confounding those with the effects of CPC+, we examined net changes in health care utilization among nonparticipating practices in CPC+ regions and unselected practices in comparison regions. Comparing utilization in 2019 to that in 2020, we found that CPC+ regions experienced about a 1 percent greater reduction in health care utilization in 2020 than comparison regions.

Key findings were as follows:

- Between 2019 and 2020, total Medicare expenditures and all-cause acute hospitalizations and outpatient ED visits all declined in unselected practices in both CPC+ regions and comparison regions, by close to 5 percent for total Medicare expenditures, 15 percent for all-cause acute hospitalizations, and over 20 percent for all-cause outpatient ED visits.
- For each of these three primary outcomes of the CPC+ impact analysis, the decline over time was smaller in CPC+ regions, by about 1 percent of the 2019 mean outcome (Table 5.D.3).
- The 1 percent differences in the 2019 to 2020 change between unselected practices in CPC+ and comparison regions were not substantially greater than differential changes observed in prior years. However, the 2019 to 2020 changes were driven by unexpectedly large declines in both groups, likely induced by COVID-19. Since underlying differences in the intensity

and timing of COVID-19, as well as in the response to COVID-19, between CPC+ and comparison regions could have affected the differential 2019 to 2020 changes, it is important to account for such factors in the impact analysis.

These findings are similar to findings in the full Medicare FFS population that used county-level data from the Assistant Secretary for Planning and Evaluation (ASPE) on Medicare claims and expenditures (see Supplement 4, Section B for results from this analysis), though the results are more similar for Track 1 than for Track 2. Expenditures declined by 8.4 percent in CPC+ regions and 6.7 percent in comparison regions—a 1.5 percentage point difference (similar to the 1 percentage point difference between unselected practices in CPC+ and comparison regions)—after weighting regions to represent Track 1 practices. Differences between the two sets of regions using county-level aggregated claims were even smaller and not statistically significant after weighting to represent Track 2 practices. County-level findings could differ from findings among unselected practices for two reasons: (1) the county-level findings include a small percentage of CPC+ beneficiaries, so unlike findings among unselected practices, changes in county-level expenditures could be affected by CPC+ in addition to COVID-19; and (2) the county-level findings are based on beneficiary residence rather than practice location, so they could include beneficiaries who live in the county but did not seek care from primary care practices located in the county, and would not include beneficiaries who sought care in the county but do not live there.

Table 5.D.3. Nonparticipating practices in CPC+ regions had greater decreases in health care utilization than unselected practices in comparison regions between 2019 and 2020: Unadjusted results

	Track 1				Track 2			
	Non-CPC+ mean	Non-comparison mean	Non-CPC+ vs. non-comparison differences in 2020 relative to 2019	Percentage difference relative to 2019 non-comparison mean[a]	Non-CPC+ mean	Non-comparison mean	Non-CPC+ vs. non-comparison differences in 2020 relative to 2019	Percentage difference relative to 2019 non-comparison mean[a]
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP (per beneficiary per month)								
Jan 2019–Dec 2019	$1,038	$1,055	-$9**	-0.8%	$1,028	$1,047	-$8**	-0.7%
Jan 2020–Dec 2020	$983	$1,008			$972	$999		
Acute hospitalizations (short-stay acute care and critical access hospitals) (per 1,000 beneficiaries per year)								
Jan 2019–Dec 2019	309	303	-3**	-1.1%	309	304	-2*	-0.8%
Jan 2020–Dec 2020	262	259			262	259		
Outpatient ED visits, including observation stays (per 1,000 beneficiaries per year)								
Jan 2019–Dec 2019	526	529	-4*	-0.7%	545	535	-9***	-1.6%
Jan 2020–Dec 2020	406	414			422	420		

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2020.

Note: Differences in the table are from time-series models run at the practice-month-year level that did not adjust for beneficiary or practice characteristics. We used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Standard errors are clustered at the practice level. For a detailed description of methods, see Supplement 5.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the non-CPC+ vs. non-comparison differences by the unadjusted 2019 non-comparison mean for the outcome.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; HRR = hospital referral region; SSP = Medicare Shared Savings Program.

Although we focused on regional changes in health care utilization to capture total effects of COVID-19, we wanted to rule out differential changes in sample composition among CPC+ versus comparison practices due to the pandemic. This is because (1) by changing patterns of health care utilization, the pandemic could potentially affect the mix of patients attributed to CPC+ versus comparison practices, and (2) there could be differential rates of practice closure in CPC+ versus the comparison group due to shortfalls in practice revenue from health care avoidance during the pandemic. We did not find any evidence that the sample of practices changed meaningfully in 2020 in either the CPC+ or the comparison group, or that there were differential changes in beneficiary sample composition for the CPC+ group relative to the comparison group (see Supplement 4, Section C for results of this analysis).

5.D.4. Approaches to account for any differences due to COVID-19

Although the magnitude of the differential decline in health care utilization from 2019 and 2020 for CPC+ versus comparison regions was small (1 percent), it could potentially bias the impact estimate for CPC+ in PY 4. This is because (1) our impact analysis relies on detecting differential changes in outcomes between baseline and each intervention year for the CPC+ versus the matched comparison practices, and (2) the differential 2019 to 2020 regional change due to the pandemic would be included in any differential change observed between CPC+ and comparison practices from baseline to PY 4 in the absence of any mechanism to tease apart the effect of CPC+ from pandemic-induced regional changes. We considered two alternative approaches to account for differences due to COVID-19 between CPC+ and comparison regions to produce an unbiased impact estimate in 2020.

A. Using COVID-19-related control variables

The first approach we investigated to avoid potential bias due to COVID-19 was to include regional, COVID-19-related controls in our primary regression models. The list of controls we tested is presented in Table 5.D.4, with more details in Supplement 5.

Table 5.D.4. COVID-19-related regional controls for fourth annual report impacts model

Control	Description	Rationale for inclusion
Excess deaths	• Excess deaths refer to the number of all-cause deaths above-and-beyond what we would have predicted given historic trends. • Excess deaths in 2020 indicates the severity of COVID-19 in the region. • Using Bayesian methods to produce accurate estimates of regional excess deaths and predictive modeling methods consistent with the recent COVID-19 literature (Polyakova et al. 2021), we created a measure of excess deaths for 335 state-HRRs containing CPC+ or comparison practices. See Supplement 2 for more details. **Year(s) available:** 2020 **Frequency:** Monthly **Geographic level for which the variable is defined:** State-HRR **Specific variable definitions included in model testing:** **1.** Excess deaths were averaged during each "wave" of the pandemic (we defined waves as follows: wave 1: March–May, wave 2: June–September, wave 3: October–December) and interacted with a year indicator for 2020. **2.** Maximum monthly excess deaths in the state-HRR, interacted with a year indicator for 2020, and the wave that the maximum value occurred (using wave 1 as the reference category) interacted with the year indicator for 2020.	Beneficiaries in regions with greater excess deaths likely experienced higher severity of COVID-19 illness, likely reflecting poorer underlying health status. These beneficiaries are likely to have higher health care utilization and expenditures for COVID-19—in particular, higher ED and inpatient care use—than beneficiaries in regions with fewer excess deaths. However, this may be offset by more delayed or avoided care among beneficiaries in regions with greater severity of COVID-19 illness.
Pandemic Vulnerability Index (PVI)	• A measure created by the National Institute of Environmental Health Sciences, North Carolina State University and Texas A&M University that evaluates how vulnerable a community is to COVID-19. • Using county- and state-level datasets, the PVI combines 12 indicators across four major domains: current infection rates (infection prevalence, rate of increase), baseline population concentration (daytime density/traffic, residential density), current interventions (social distancing, testing rates), and health and environmental vulnerabilities (susceptible populations, air pollution, age distribution, comorbidities, health disparities, and hospital beds). These 12 indicators are then integrated at the county level into an overall PVI score. **Year(s) available:** 2020 **Frequency:** Monthly **Geographic level for which the variable is defined:** County **Specific variable definitions included in model testing:** Calculated the average value of the PVI for each county during the three waves (described above) and interacted the values with a year indicator for 2020.	Some regions may have greater vulnerability to the pandemic and higher PVI scores—for example, if they have a more susceptible population or lax COVID-19-related local interventions. Beneficiaries in these regions are more likely to incur higher utilization and expenses related to COVID-19 than beneficiaries in regions with lower PVI scores. At the same time, regions with higher PVI scores could also experience greater indirect effects in the form of health care avoidance.
Government Response Index (GRI)	• The Oxford Covid-19 Government Response Tracker collects systematic information on policy measures that governments have taken to tackle COVID-19. • Policy responses are coded into 23 indicators, such as school closures, travel restrictions, and vaccination policy. The GRI is a composite measure based on all 23 indicators tracked by the project. **Year(s) available:** 2020 **Frequency:** Yearly **Geographic level for which the variable is defined:** State **Specific variable definitions included in model testing:** Interacted the values of the GRI with a year indicator for 2020.	Beneficiaries in regions that had a stronger government response to COVID-19 tended to have a lower incidence of COVID-19 (Islam et al. 2020) in the long run, which may lead to lower health care utilization and expenditures for COVID-19 in the region.

Table 5.D.4 *(continued)*

Control	Description	Rationale for inclusion
Social Vulnerability Index (SVI)	• Social vulnerability refers to the resilience of communities when responding to or recovering from threats to public health. • The SVI, prepared by the Centers for Disease Control and Prevention, draws together 16 different measures of vulnerability in three themes: (1) socioeconomic (for example, poverty, unemployment); (2) demographic (for example, number of elderly and disabled); and (3) housing/transportation (for example, percentage of mobile homes, households with no vehicle). • For every measure, census tracts above the 90th percentile, or the most vulnerable 10 percent of communities, are assigned a flag. The SVI is created by counting the total number of flags in each census tract. The higher the count, the more vulnerable the population. **Year(s) available:** 2000, 2010, 2014, 2016, 2018[a] **Frequency:** Biannually **Geographic level for which the variable is defined:** Census tract **Specific variable definitions included in model testing:** Interacted the values of the SVI with a year indicator for 2020.	Communities with higher SVI scores had higher rates of COVID-19 infections and deaths compared to communities with lower SVI scores (Freese et al. 2021; Islam et al. 2021; Karaye et al. 2020), which could have led to higher health care utilization and expenditures for COVID-19. Compared to the PVI, the SVI captures different aspects of vulnerability. For example, the SVI includes community levels of poverty, while the PVI focuses on COVID-19-specific measures. Also, the SVI is measured at a more granular level—census tract as opposed to county.

[a] The analyses in this Appendix use the 2016 version of the Social Vulnerability Index, but in the remainder of the report we updated to the 2018 version of the Social Vulnerability Index to more closely reflect social vulnerability during the COVID-19 pandemic.
ED = emergency department; HRR = hospital referral region.

Our goal was to include controls that measure underlying health status and vulnerability to COVID-19, as well as resilience and mitigation efforts that we do not capture with other controls included in the CPC+ impact evaluation. The CPC+ impact evaluation includes beneficiary controls, like beneficiary chronic conditions, and practice fixed effects, which capture time-invariant practice characteristics.

We investigated results from regression models that estimate the differential change in outcomes between (1) unselected practices in CPC+ and comparison regions and (2) CPC+ and matched comparison practices—from 2019 to 2020, when we included beneficiary controls and practice fixed effects (to mimic our annual impact models as much as possible), and we additionally included the COVID-19-related controls. The practice-level analysis was based on outcomes aggregated at the practice level for beneficiaries who were enrolled in Medicare FFS during any given month in 2019 or 2020 and were assigned to one of the four practice types: CPC+ practices, comparison practices, nonparticipating practices in CPC+ regions, and unselected practices in comparison regions. Although unselected practices in CPC+ and comparison regions were not matched at baseline and thus may have had some pre-existing differences in 2019, we focus our analysis largely on 2019-to-2020 changes between these practice groups to estimate regional differences that are not due to the CPC+ model. A detailed description of our methods is available in Supplement 5.

Results from these regressions with additional controls showed that:

- Adjusting for beneficiary controls and practice fixed effects produced differences between unselected practices in CPC+ and comparison regions in 2020 that are less than 1 percent of the 2019 unadjusted mean for unselected practices in comparison regions. Some of these

differences were statistically different from zero, most notably the estimates for Medicare expenditures.

- Including COVID-19-related controls in addition to beneficiary characteristics and practice fixed effects further reduced differences between unselected practices in CPC+ and comparison regions by more than half for most outcomes. Adjusted differences for Medicare expenditures, as a percentage of the 2019 unadjusted mean for unselected practices in comparison regions, decreased from -0.85 to -0.31 percent in Track 1 and from -0.62 to -0.27 percent in Track 2 after including the COVID-19-related controls. Both estimates were no longer statistically distinguishable from zero. Adjusted differences in acute hospitalizations that were not statistically significant even before including the COVID-19-related controls decreased further to -0.23 and 0.03 percent in Tracks 1 and 2, respectively. Adjusted differences in outpatient ED visits, which were not statistically significant for Track 1 but were marginally significant for Track 2, remained similar with the inclusion of COVID-19-related controls, with estimates of 0.21 and -0.69 percent for Tracks 1 and 2, respectively.[73]
- The findings for CPC+ and comparison practices in Tables 5.D.5 and 5.D.6 were largely consistent with the findings for unselected practices in CPC+ and comparison regions. That is, after including the COVID-19-related controls, differences between CPC+ and comparison practices in their 2019-to-2020 changes were notably smaller compared to results from models that adjusted only for beneficiary controls and practice fixed effects, particularly for Medicare expenditures.

[73] The difference in the 2019-to-2020 change in outpatient ED visits for Track 2, which was 0.62 percent lower for nonparticipating practices in CPC+ regions relative to unselected practices in comparison regions, suggests that there may be differences in ED visit trends among unselected practices in CPC+ and comparison regions. This is possible, especially since these practices were not matched at baseline. This difference remained similar after including the COVID-19-related controls, suggesting that the difference was not explained by COVID-19.

Table 5.D.5. Using COVID-19-related controls reduced small differences between unselected CPC+ and comparison practices in 2020 by more than half, Track 1

	Unadjusted means				Regression-adjusted CPC+ vs. comparison differences in 2020 relative to 2019		Regression-adjusted non-CPC+ vs. non-comparison differences in 2020 relative to 2019	
	CPC+	Comparison	Non-CPC+	Non-comparison	Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]	Estimate (SE)	Percentage difference relative to 2019 non-comparison mean[b]
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP (per beneficiary per month)								
Using practice fixed effects and beneficiary controls								
Jan 2019–Dec 2019	$991	$993	$1,038	$1,055	-7.2** ($3.5)	-0.73%	-$9.0*** ($3.0)	-0.85%
Jan 2020–Dec 2020	$941	$952	$983	$1,008				
Using practice fixed effects and beneficiary controls, and COVID-19-related controls								
Jan 2019–Dec 2019	$991	$993	$1,038	$1,055	-$1.8 ($3.6)	-0.18%	-$3.3 ($3.3)	-0.31%
Jan 2020–Dec 2020	$941	$952	$983	$1,008				
Acute hospitalizations (short-stay acute care and critical access hospitals) (per 1,000 beneficiaries per year)								
Using practice fixed effects and bene controls								
Jan 2019–Dec 2019	284	284	309	303	-1.1 (1.3)	-0.39%	-1.6 (1.2)	-0.53%
Jan 2020–Dec 2020	243	245	262	259				
Using practice fixed effects and bene controls, and COVID-19-related controls								
Jan 2019–Dec 2019	284	284	309	303	-0.2 (1.3)	-0.07%	-0.7 (1.3)	-0.23%
Jan 2020–Dec 2020	243	245	262	259				
Outpatient ED visits, including observation stays (per 1,000 beneficiaries per year)								
Using practice fixed effects and beneficiary controls								
Jan 2019–Dec 2019	486	494	526	529	-0.1 (2.3)	-0.02%	-1.1 (1.8)	-0.21%
Jan 2020–Dec 2020	378	388	406	414				
Using practice fixed effects and beneficiary controls, and COVID-19-related controls								
Jan 2019–Dec 2019	486	494	526	529	0.4 (2.4)	0.08%	1.1 (1.9)	0.21%
Jan 2020–Dec 2020	378	388	406	414				
Unweighted sizes								
Number of practices	1,373	5,242	8,648	21,091				
Number of beneficiaries	1,017,953	3,492,930	2,501,684	7,239,817				

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2020.

Table 5.D.5 *(continued)*

Note: Estimates in the table are derived from separate models run at the practice-month-year level that are regression-adjusted for (1) baseline beneficiary HCC scores and practice fixed effects and (2) baseline beneficiary HCC scores, practice fixed effects, and COVID-19-related controls. For CPC+ practices, observations are weighted by the number of Medicare FFS beneficiaries assigned to the practice during the month and year. For comparison practices, the weight is a product of the number of assigned beneficiaries and the matching weight. For non-CPC+ and non-comparison practices, we used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Standard errors are clustered at the practice level. For a detailed description of methods, see Supplement 5.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the estimated CPC+ versus comparison differences by the unadjusted 2019 comparison mean for the outcome.

[b] To calculate these percentages, we divided the non-CPC+ versus non-comparison differences by the unadjusted 2019 non-comparison mean for the outcome.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; HRR = hospital referral region; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.D.6. Using COVID-19-related controls reduced small differences between unselected CPC+ and comparison practices in 2020 by more than half, Track 2

	Unadjusted means				Regression-adjusted CPC+ vs. comparison differences in 2020 relative to 2019		Regression-adjusted non-CPC+ vs. non-comparison differences in 2020 relative to 2019	
	CPC+	Comparison	Non-CPC+	Non-comparison	Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]	Estimate (SE)	Percentage difference relative to 2019 non-comparison mean[b]
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP (per beneficiary per month)								
Using practice fixed effects and beneficiary controls								
Jan 2019–Dec 2019	$987	$994	$1,028	$1,047	-$6.6** ($3.4)	-0.66%	-$6.5** ($3.1)	-0.62%
Jan 2020–Dec 2020	$937	$952	$972	$999				
Using practice fixed effects and beneficiary controls, and COVID-19-related controls								
Jan 2019–Dec 2019	$987	$994	$1,028	$1,047	-$1.3 ($3.4)	-0.13%	-$2.8 ($3.3)	-0.27%
Jan 2020–Dec 2020	$937	$952	$972	$999				
Acute hospitalizations (short-stay acute care and critical access hospitals) (per 1,000 beneficiaries per year)								
Using practice fixed effects and beneficiary controls								
Jan 2019–Dec 2019	286	287	309	304	-0.9 (1.3)	-0.31%	-0.4 (1.2)	-0.13%
Jan 2020–Dec 2020	244	246	262	259				
Using practice fixed effects and beneficiary controls, and COVID-19-related controls								
Jan 2019–Dec 2019	286	287	309	304	-0.4 (1.4)	-0.14%	0.1 (1.3)	0.03%
Jan 2020–Dec 2020	244	246	262	259				
Outpatient ED visits, including observation stays (per 1,000 beneficiaries per year)								
Using practice fixed effects and beneficiary controls								
Jan 2019–Dec 2019	486	489	545	535	-1.3 (2.1)	-0.27%	-3.3*[c] (2.0)	-0.62%
Jan 2020–Dec 2020	379	385	422	420				
Using practice fixed effects and beneficiary controls, and COVID-19-related controls								
Jan 2019–Dec 2019	486	489	545	535	-0.2 (2.2)	-0.04%	-3.7*[c] (2.0)	-0.69%
Jan 2020–Dec 2020	379	385	422	420				
Unweighted sizes								
Number of practices	1,515	3,783	7,972	20,517				
Number of beneficiaries	1,241,055	2,962,038	2,197,257	7,015,409				

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2020.

Table 5.D.6 *(continued)*

Note: Estimates in the table are derived from separate models run at the practice-month-year level that are regression-adjusted for (1) baseline beneficiary HCC scores and practice fixed effects and (2) baseline beneficiary HCC scores, practice fixed effects, and COVID-19-related controls. For CPC+ practices, observations are weighted by the number of Medicare FFS beneficiaries assigned to the practice during the month and year. For comparison practices, the weight is a product of the number of assigned beneficiaries and the matching weight. For non-CPC+ and non-comparison practices, we used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Standard errors are clustered at the practice level. For a detailed description of methods, see Supplement 5.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the estimated CPC+ versus comparison differences by the unadjusted 2019 comparison mean for the outcome.

[b] To calculate these percentages, we divided the non-CPC+ versus non-comparison differences by the unadjusted 2019 non-comparison mean for the outcome.

[c] This difference of 3.3 fewer outpatient ED visits per 1,000 beneficiaries per year in the 2019-to-2020 change for nonparticipating practices in Track 2 CPC+ regions relative to unselected practices in Track 2 comparison regions suggests that there may be differences in ED visit trends in unselected practices in CPC+ and comparison regions. This is possible, especially because these practices were not matched at baseline. This difference remained similar after includingCOVID-19-related controls, suggesting that the difference was not explained by COVID-19. We explored this difference further, including an examination of outcome trends from baseline to the intervention period among unselected practices, when conducting the triple-differences analysis for the fourth annual report.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; SE = standard error; SSP = Medicare Shared Savings Program.

B. Triple-differences model

Another option we considered to account for regional bias in the effects of COVID-19 was to proceed with a triple-differences model accounting for trends among unselected practices in the same regions as CPC+ and comparison practices. That is, instead of including COVID-19-related controls in the regression models, the triple-differences approach nets out the difference in changes in outcomes between non-CPC+ practices and non-comparison practices. These additional reference groups likely experienced similar effects of COVID-19 as other practices within their region. Introducing these reference groups and assuming that, in the absence of the CPC+ model, the difference in trends between CPC+ and nonparticipating practices in CPC+ regions would be similar to the difference in trends between comparison practices and unselected practices in comparison regions, the triple-differences model can remove differential changes in outcomes due to COVID-19 and identify unbiased impact estimates.

With the same sample we used to investigate how estimates change with the inclusion of COVID-19-related controls, we found that:

- Estimates from the triple-differences models, adjusted for beneficiary characteristics and practice fixed effects, equaled a 0.18 and -0.01 percent difference in expenditures between CPC+ and comparison practices in Tracks 1 and Tracks 2, respectively (Tables 5.D.7 and 5.D.8). These results were smaller compared to the corresponding difference-in-differences estimates with COVID-19-related controls for unselected practices in CPC+ and comparison regions in both Tracks (-0.31 percent in Track 1; -0.27 percent in Track 2) and CPC+ versus comparison practices in Track 2 (-0.13 percent).
- For acute hospitalizations and outpatient ED visits, the triple-differences models produced similar estimates (in terms of percentage differences relative to the 2019 comparison mean) compared to the difference-in-differences models with COVID-19 controls in Track 1. In Track 2, the triple-differences models produced smaller estimates for acute hospitalizations (0.39 percent) compared to the difference-in-differences estimates with COVID-19 controls for unselected practices in CPC+ and comparison regions (-0.69 percent).

Table 5.D.7. Both COVID-19-related controls and triple-differences models reduce differences between CPC+ and comparison practices in 2020, relative to 2019, Track 1

Difference-in-differences for CPC+ vs. comparison practices in 2020 relative to 2019 with COVID-19-related controls		Difference-in-differences for non-CPC+ vs. non-comparison practices in 2020 relative to 2019 with COVID-19-related controls		Triple-differences model	
Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]	Estimate (SE)	Percentage difference relative to 2019 non-comparison mean[b]	Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP (per beneficiary per month)					
-$1.8	-0.18%	-$3.3	-0.31%	$1.8	0.18%
($3.6)		($3.3)		($4.7)	
Acute hospitalizations (short-stay acute care and critical access hospitals) (per 1,000 beneficiaries per year)					
-0.2	-0.07%	-0.7	-0.23%	0.5	0.18%
(1.3)		(1.3)		(1.8)	
Outpatient ED visits, including observation stays (per 1,000 beneficiaries per year)					
0.4	-0.08%	1.1	0.21%	-1.1	-0.22%
(2.4)		(1.9)		(2.9)	

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2020.

Note: Estimates in the table are derived from models run at the practice-month-year level that are regression-adjusted for baseline beneficiary HCC scores, practice fixed effects and, in the difference-in-differences models, COVID-19-related controls. For CPC+ practices, observations are weighted by the number of Medicare FFS beneficiaries assigned to the practice during the month and year. For comparison practices, the weight is a product of the number of assigned beneficiaries and the matching weight. For non-CPC+ and non-comparison practices, we used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Standard errors are clustered at the practice level. For a detailed description of methods, see Supplement 5.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the estimated CPC+ versus comparison differences by the unadjusted 2019 comparison mean for the outcome.

[b] To calculate these percentages, we divided the non-CPC+ versus non-comparison differences by the unadjusted 2019 non-comparison mean for the outcome.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.D.8. Both COVID-19-related controls and triple-differences reduce differences between CPC+ and comparison practices in 2020, relative to 2019, Track 2

Difference-in-differences for CPC+ vs. comparison practices in 2020 relative to 2019 with COVID-related controls		Difference-in-differences for non-CPC+ vs. non-comparison practices in 2020 relative to 2019 with COVID-related controls		Triple-differences model	
Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]	Estimate (SE)	Percentage difference relative to 2019 non-comparison mean[b]	Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP (per beneficiary per month)					
-$1.3	-0.13%	-$2.8	-0.27%	-$0.1	-0.01%
($3.4)		($3.3)		($4.6)	
Acute hospitalizations (short-stay acute care and critical access hospitals) (per 1,000 beneficiaries per year)					
-0.4	-0.14%	0.1	0.03%	-0.5	-0.17%
(1.4)		(1.3)		(1.8)	
Outpatient ED visits, including observation stays (per 1,000 beneficiaries per year)					
-0.2	-0.04%	-3.7*	-0.69%	1.9	0.39%
(2.2)		(2.0)		(2.8)	

Source: Mathematica's analysis of Medicare claims data from January 2019 through December 2020.

Note: Estimates in the table are derived from models run at the practice-month-year level that are regression-adjusted for baseline beneficiary HCC scores, practice fixed effects and, in the difference-in-differences models, COVID-19-related controls. For CPC+ practices, observations are weighted by the number of Medicare FFS beneficiaries assigned to the practice during the month and year. For comparison practices, the weight is a product of the number of assigned beneficiaries and the matching weight. For non-CPC+ and non-comparison practices, we used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Standard errors are clustered at the practice level. For a detailed description of methods, see Supplement 5.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the estimated CPC+ versus comparison differences by the unadjusted 2019 comparison mean for the outcome.

[b] To calculate these percentages, we divided the non-CPC+ versus non-comparison differences by the unadjusted 2019 non-comparison mean for the outcome.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; SE = standard error; SSP = Medicare Shared Savings Program.

Although the triple-differences model accounts for the possibility of regional bias due to COVID-19, there are several technical limitations with this approach. We describe these limitations below to caution against interpreting the change in estimates for Medicare expenditures in the triple-differences model as an improvement over the difference-in-differences models with COVID-19-related controls for CPC+ and comparison practices.

- **Imbalance.** First, unlike CPC+ and comparison practices, unselected practices were not matched and, therefore, are not well balanced on baseline characteristics. This lack of baseline balance requires us to make the strong assumption that any difference between unselected practices in CPC+ and comparison regions changed linearly after COVID-19. If, on average, COVID-19 affects practices with different characteristics differently, or has non-linear effects on outcomes, then the necessary parallel-trends assumption for generating unbiased impact estimates would not hold. This is also a limitation when interpreting results from the difference-in-differences models with COVID-19-related controls for unselected

practices in CPC+ and comparison regions. It is reassuring, however, that those results as well as those derived from the difference-in-differences models with COVID-19-related controls for CPC+ and comparison practices were notably smaller compared to estimates from models that adjust only for beneficiary controls and practice fixed effects.

- **Potential spillover effects.** Additionally, this analysis assumes there are no spillovers of CPC+ on nonparticipating practices. If there are spillovers (for example, favorable impacts of CPC+ that spill over to nonparticipating practices that are owned by the same parent entity), the triple-differences model would net out part of the effect of CPC+ and dilute the estimated effects of the CPC+ model relative to estimates derived from difference-in-differences models for CPC+ and comparison practices.
- **Less power.** Finally, we have less power to detect effects with the triple-differences model compared to the difference-in-differences model because of the added uncertainty from estimating an additional layer of difference.[74]

In addition to the technical limitations, we also considered some logistical challenges. Most notably, the triple-differences models are much more resource intensive to implement compared to the difference-in-differences models, particularly processing the larger triple-differences sample and obtaining triple-differences estimates from the large number of regressions across all outcomes.[75] Moreover, if the triple-differences model had become the primary model for the impact analysis, we would have needed to add sensitivity tests and additional tests for model accuracy.

5.D.5. Key takeaways

Below we summarize our key findings on the direct and total effects of COVID-19 on excess deaths, health care utilization, and Medicare expenditures, as well as approaches to mitigate any potential bias in PY 4 CPC+ impact estimates due to COVID-19.

A. Direct effects of COVID-19

- Over the course of 2020, around 7 percent of CPC+ and comparison beneficiaries and 8 percent of beneficiaries in unselected practices in both CPC+ and comparison regions had a Medicare Part A or B claim with a COVID-19-related diagnosis. CPC+ and comparison beneficiaries with a COVID-19 diagnosis were similar on characteristics such as age, race, original reason for Medicare entitlement, and chronic conditions.
- Rates of COVID-19-related outpatient ED visits, inpatient hospitalizations, and inpatient expenditures were lower in CPC+ regions than in comparison regions for both selected and unselected practices. Although most of the observed differences in unadjusted rates were

[74] The standard errors in a test run of the fourth annual report triple-differences model on Medicare expenditures were approximately 30 percent larger than the size of the standard errors in test runs of the fourth annual report difference-in-differences models on Medicare expenditures for both Track 1 and 2.

[75] In fourth annual report test runs on Medicare expenditures, the triple differences model took approximately 75 percent longer to run than the difference-in-differences model.

statistically significant, the magnitudes of those differences were small. CPC+ beneficiaries and beneficiaries attributed to nonparticipating practices in CPC+ regions had one fewer COVID-19-related ED visit and one fewer inpatient admission per 1,000 beneficiaries in 2020 relative to beneficiaries in comparison practices and unselected practices in comparison regions.

- We estimated just under 20 percent excess death rates from March through December 2020 for all Medicare FFS beneficiaries living in both the CPC+ and comparison regions.
- Timing of peaks in COVID-19 diagnoses, related acute care utilization and Medicare expenditures, and excess deaths emerged earlier in CPC+ regions, reflecting the geographic spread of COVID-19 across the country and the pandemic's early onset in the New Jersey region.

B. Total effects of COVID-19

- Between 2019 and 2020, Medicare expenditures without enhanced payments, all-cause acute hospitalizations, and outpatient ED visits all declined for unselected practices in both CPC+ regions and comparison regions, by close to 5 percent for Medicare expenditures, 15 percent for all-cause acute hospitalizations, and over 20 percent for all-cause outpatient ED visits.
- For each of these key outcomes of the CPC+ impact analysis, unselected practices in CPC+ regions experienced about a 1 percent greater reduction in health care utilization in 2020 than unselected practices in comparison regions.
- The 1 percent difference in the 2019 to 2020 change between unselected practices in CPC+ and comparison regions was not substantially greater than differential changes observed in prior years.
- We did not find any evidence of meaningful changes in the sample of CPC+ or comparison practices in 2020 due practice closures, or differential changes in the number of beneficiaries attributed to CPC+ or comparison practices due to changes in healthcare utilization during the pandemic.

C. Approaches to account for any potential bias due to COVID-19

- Adding COVID-19-related regional controls for excess deaths, indices of pandemic and social vulnerability, and indices of state policy responses reduced the 1 percent difference in Medicare expenditures, all-cause hospitalizations, and all-cause ED visits between unselected practices in CPC+ and comparison regions by more than one-half, leading to differences similar in magnitude to differential changes observed in prior years.
- Using a triple-differences model reduced differences in Medicare expenditures, all-cause acute hospitalizations, and all-cause outpatient ED visits between CPC+ and comparison practices modestly more than the difference-in-differences model with COVID-19-related regional control variables. However, using triple-differences as the primary model would have involved considerable logistical challenges and technical limitations.

- We proceeded with using a difference-in-differences model with regional COVID-19-related controls for the primary analysis for the fourth annual report CPC+ impact evaluation, along with:
  - The triple-differences model as a key sensitivity test.
  - An additional sensitivity test for the key outcomes of Medicare expenditures without enhanced payments, number of all-cause acute hospitalizations, and number of outpatient ED visits that excluded claims during peak health care avoidance months of March through May 2020.

Supplement 1: Additional results for COVID-19-related diagnoses

This supplement provides additional results relevant for comparing COVID-19-related diagnoses in CPC+ and comparison practices. We first report the regional distribution of CPC+ and comparison practices in 2020, which is notable because of geographic differences in the spread of COVID-19 in the US in 2020. We then report trends in COVID-19-related diagnoses in 2020 and, finally, characteristics of beneficiaries with a COVID-19-related diagnosis in 2020.

A. Regional distribution of CPC+ and comparison practices

Figure 5.D.i shows the regional distribution of Track 1 and Track 2 CPC+ and comparison practices, using darker colors for states with a higher concentration of beneficiaries included in the 2020 ITT analysis sample. New Jersey has the largest concentration of Track 1 CPC+ beneficiaries (18 percent of all Track 1 CPC+ beneficiaries) and makes up a smaller proportion of the Track 2 CPC+ ITT analysis sample (10 percent). Ohio has the largest concentration of Track 2 CPC+ beneficiaries (20 percent). Illinois and Pennsylvania have the highest concentration of comparison beneficiaries, making up between 11 and 12 percent of the Track 1 and Track 2 comparison ITT sample.

Figure 5.D.i. CPC+ and comparison practices were selected from different regions[a]

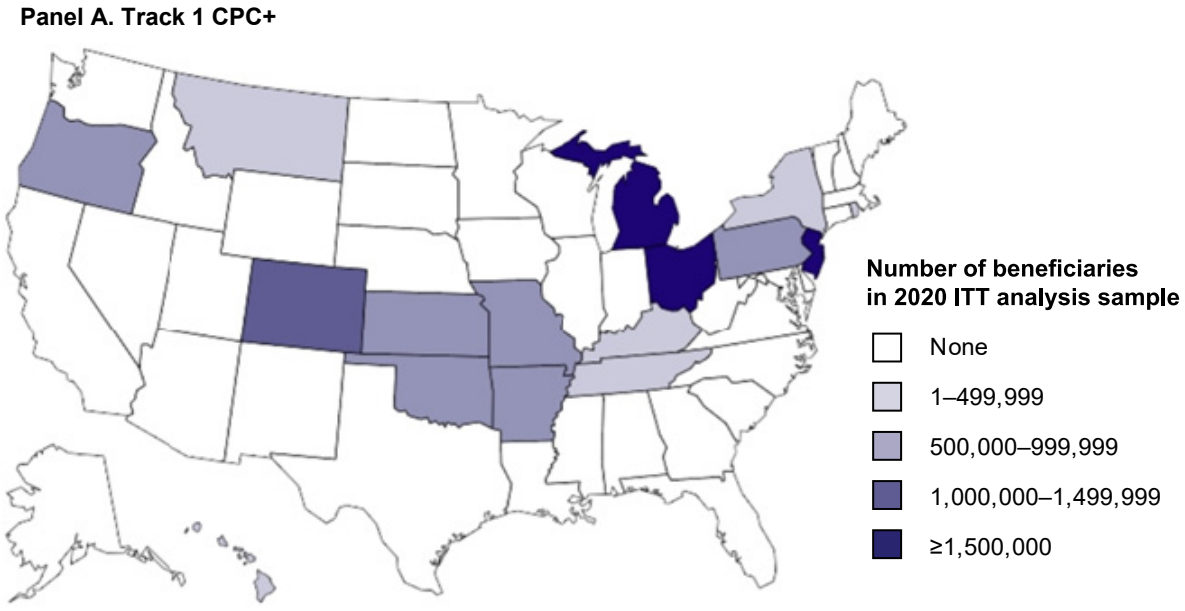
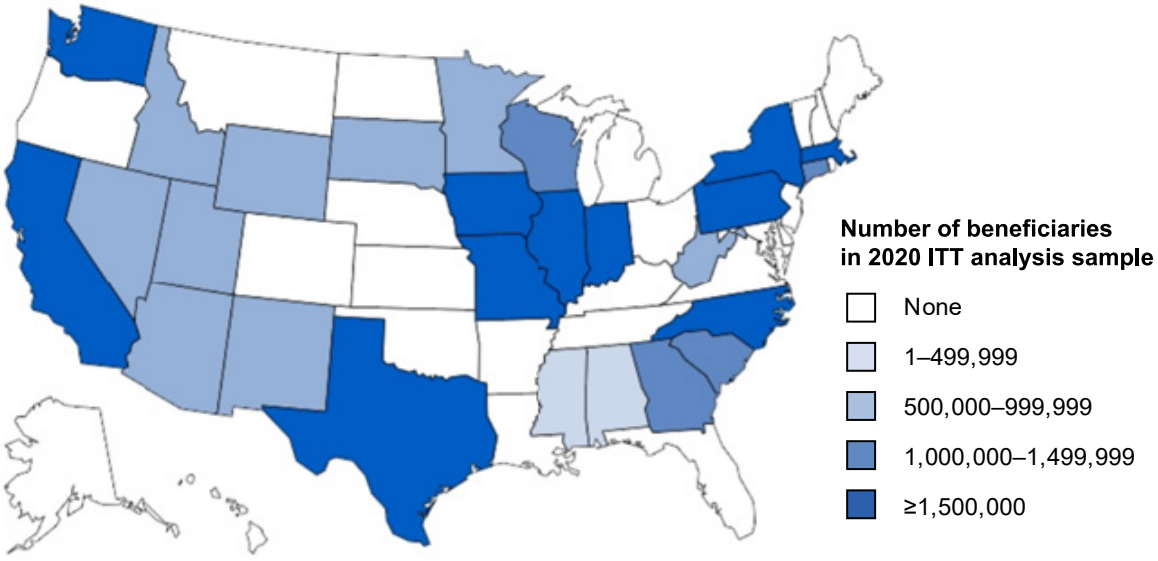


Figure 5.D.i *(continued)*

Panel B. Track 1 Comparison



Panel C. Track 2 CPC+

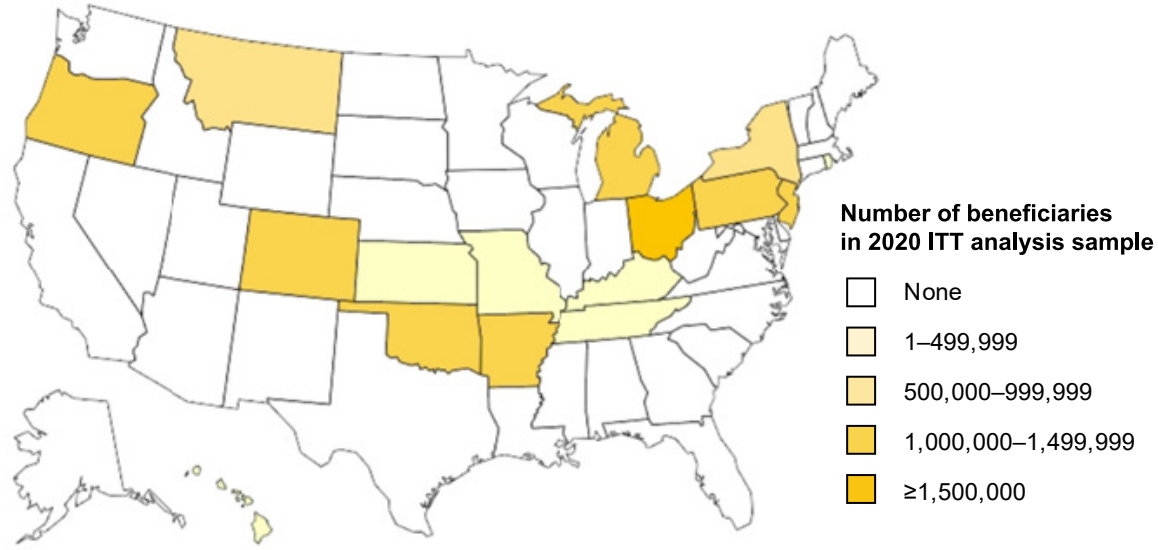
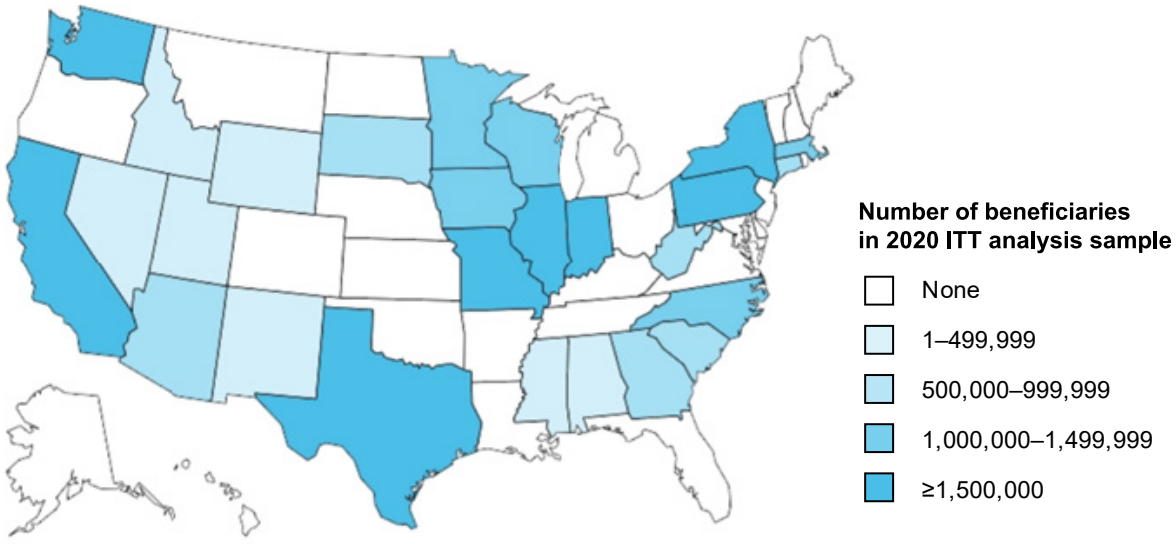


Figure 5.D.i *(continued)*

Panel D. Track 2 Comparison



Source: Mathematica's analysis of data on the number of Medicare beneficiaries assigned to CPC+ and comparison practices in 2020 from Medicare Enrollment Database. The geographic locations of practices are from IQVIA data. Eligible beneficiary months are weighted by the practice matching weight for comparison practices.

Note: CPC+ and comparison practices in New York, Pennsylvania, and Missouri are in different regions within the state. CPC+ regions include the North Hudson-Capital region in New York, the Kansas City region in Kansas and Missouri, and the Philadelphia region of Pennsylvania.

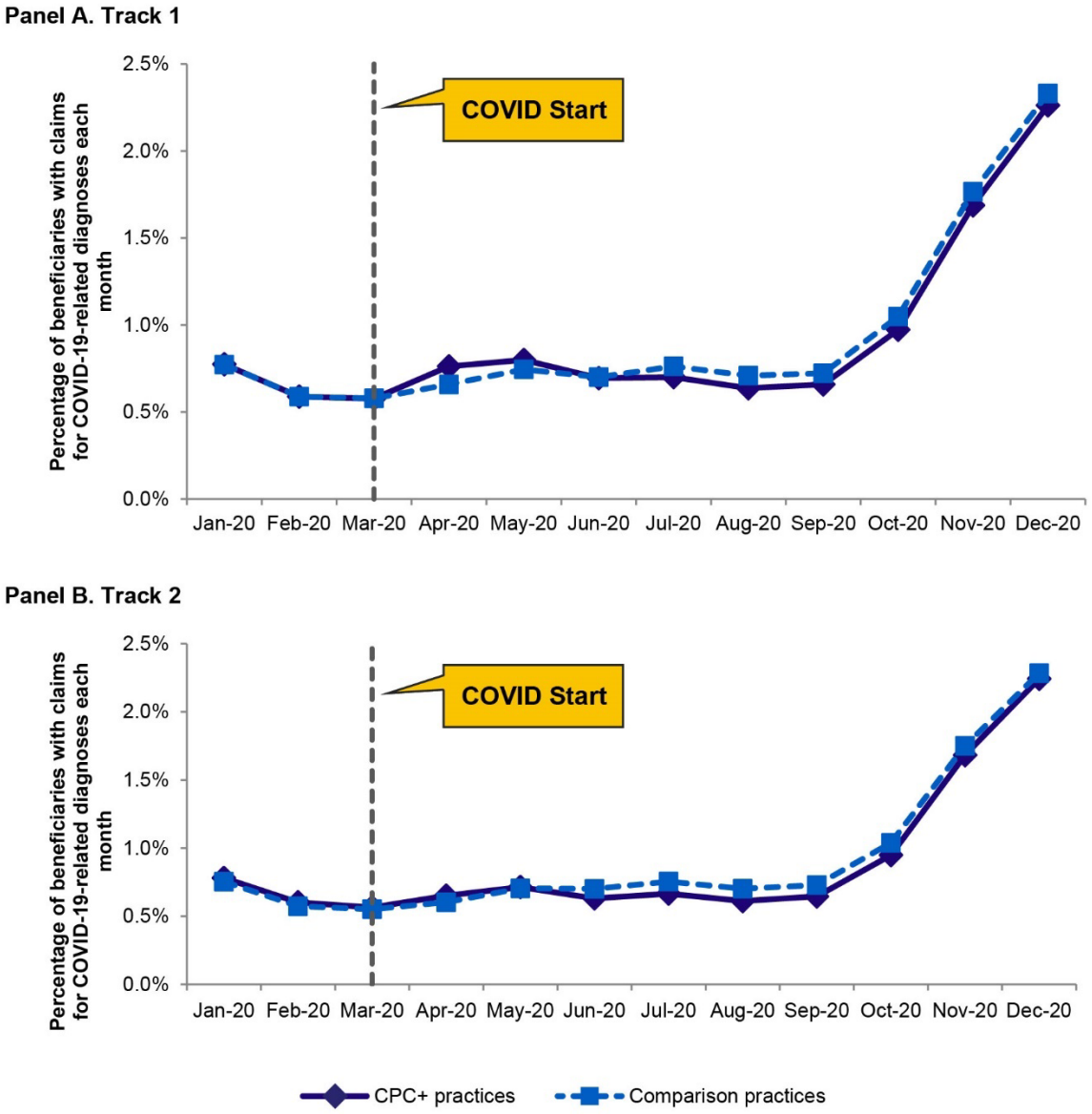
[a] Regions here are defined as states or contiguous counties.

CPC+ = Comprehensive Primary Care Plus; ITT = intent to treat.

B. Trends in COVID-19-related diagnoses

Figure 5.D.ii shows trends in COVID-19-related diagnoses for CPC+ and comparison practices in 2020. Prior to March 2020, less than 1 percent of beneficiaries had a respiratory or coronavirus diagnosis each month, with the highest rates in January, a common time for respiratory viruses. Diagnoses were modestly higher in CPC+ practices in April, at the beginning of the COVID-19 pandemic. Starting in June and July, comparison practice diagnoses surpassed those for CPC+ practices and were higher through the rest of 2020. Differences between CPC+ and comparison practices in April 2020 were somewhat more pronounced for Track 1 practices, likely driven by New Jersey, which was hit hard early in the pandemic and has a high proportion of Track 1 CPC+ practices.

Figure 5.D.ii. CPC+ and comparison beneficiaries had similar rates of COVID-19-related diagnoses during 2020 but the timing of diagnoses differed, reflecting the geographic spread of COVID-19 across the country



Source: Medicare Part A and B claims data from 2020.

Note: COVID-19-related diagnoses include COVID-19 diagnoses and respiratory conditions related to COVID-19 including viral pneumonia, acute bronchitis, lower respiratory infection, and acute respiratory distress syndrome. See Bohl and Roozeboom-Baker (2020) for details. For comparison practices, percentages are weighted by matching weights.

CPC+ = Comprehensive Primary Care Plus.

C. Characteristics of beneficiaries with COVID-19-related diagnoses

Beneficiaries diagnosed with COVID-19-related conditions in 2020 accounted for 7 percent of the full intent-to-treat (ITT) analysis sample, with similar diagnosis rates in CPC+ and comparison groups and by track. Compared to the full ITT analysis sample, these beneficiaries tended to have more chronic conditions, including diabetes (22–23 percent versus 16–17 percent), chronic obstructive pulmonary disease (20–21 percent versus 11–12 percent),

congestive heart failure (20–21 percent versus 12–13 percent), and cardiovascular disease—including ischemic heart disease, acute myocardial infarction, and angina—(9–10 percent versus 6 percent), and higher hierarchical condition category (HCC) scores (1.8 versus 1.2). As shown in Table 5.D.i, all characteristics we examined were similar for CPC+ and comparison beneficiaries diagnosed with COVID-19-related conditions in each track.

Table 5.D.i. Characteristics of beneficiaries diagnosed with a COVID-19-related condition in 2020 were similar for CPC+ and comparison practices in each track (data in percentages, unless otherwise noted)

	Track 1				Track 2			
Measure	CPC+[a] (N = 78,613)	Comparison[a] (N = 272,852)	Difference	Standardized difference	CPC+[a] (N = 93,669)	Comparison[a] (N = 228,686)	Difference	Standardized difference
Age (mean)	73.6	73.5	0.0	0.00	73.5	73.4	0.1	0.01
Race								
White	87.5	87.3	0.2	0.01	87.3	87.1	0.2	0.00
Black	5.9	6.3	-0.4	-0.02	6.7	6.7	0.1	0.00
Other	6.6	6.4	0.2	0.01	6.0	6.2	-0.2	-0.01
Male	40.6	41.4	-0.8	-0.02	40.7	41.1	-0.4	-0.01
Original reason for Medicare eligibility								
Age	76.8	76.4	0.4	0.01	76.5	75.8	0.7	0.02
Disabled	22.3	22.5	-0.2	0.00	22.5	23.0	-0.5	-0.01
ESRD	1.0	1.2	-0.2	-0.02	1.0	1.2	-0.2	-0.02
Chronic conditions								
Diabetes with Chronic Complications	22.5	22.4	0.1	0.00	22.9	22.7	0.3	0.01
Chronic Obstructive Pulmonary Disease	20.9	20.0	0.9	0.02	20.5	19.6	0.8	0.02
Congestive Heart Failure	20.7	20.4	0.3	0.01	20.8	20.2	0.6	0.02
Ischemic Heart Disease, Acute Myocardial Infarction, Angina	10.0	8.7	1.2	0.04	9.6	8.7	1.0	0.03
HCC score[b]	1.8	1.8	0.0	0.01	1.8	1.8	0.0	0.00

Source: Mathematica's analysis of Medicare claims and enrollment data for January 2018 through January 2020.

Note COVID-19-related diagnoses include COVID-19 diagnoses and respiratory conditions related to COVID-19 including viral pneumonia, acute bronchitis, lower respiratory infection, and acute respiratory distress syndrome. See Bohl and Roozeboom-Baker (2020) for details. Characteristics were measured as of January 1, 2020, using a two-year look-back period for chronic conditions.

[a] Means were weighted to account for (1) the share of the year for which the beneficiary's data were observed and (2) the matching (for beneficiaries in comparison practices only).

Table 5.D.i *(continued)*

[b] HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

ESRD = end-stage renal disease; FFS = fee-for-service; HCC = hierarchical condition category.

Supplement 2: Detailed methods and additional results for the excess deaths analysis

This supplement provides detailed methods and additional results for the calculation of average excess deaths in CPC+ and comparison regions. We defined excess deaths as the difference between observed deaths in March through December 2020 and predicted deaths, given historic trends from 2016 through 2019. We compared excess deaths rates among all Medicare fee-for-service (FFS) beneficiaries in regions containing CPC+ practices and regions containing comparison practices. This supplement proceeds by (1) describing the study population and weights, (2) providing information about the regression approach used to predict deaths if the COVID-19 pandemic had not occurred, and (3) showing trends over time in observed deaths and predicted deaths if COVID-19 had not occurred.

A. Study population, unit of observation, outcomes, and controls

Study population. Calculations of excess deaths in the Medicare FFS population include 89 state and hospital referral region (HRR) combinations (referred to as state-HRRs) containing CPC+ practices and 253 state-HRRs containing comparison practices, across both Tracks 1 and 2.[76] On average across the five years of the analysis (2016–2020), there were 7 million Medicare FFS beneficiaries included in the analysis from CPC+ regions and 19 million Medicare FFS beneficiaries included in the analysis from comparison regions.[77]

Unit of observation. The unit of observation in the regressions is a combination of state-HRR, month, year, CPC+ region, age group, race, and sex.[78] That is, each state-HRR has observations that correspond to the months from January 2016 to December 2020 (60 months), with each month further divided into combinations of age group, race, and sex (24 combinations), a total of 1,440 observations for each state-HRR (60 x 24).[79] Age groups included 0–64 years, 65–74 years, 75–84 years, and 85 and more years. Race categories included White, Black, and all other (non-White or non-Black). Each observation was constructed using outcomes from beneficiaries who lived in that state-HRR during each month and were in the age, race, and sex category of the observation, according to Medicare enrollment data.

[76] Most state-HRRs should contain only CPC+ or only comparison practices, and therefore have one observation per month in the data. However, there are seven state-HRR combinations from NY, PA, KS, and MO that include both CPC+ and comparison practices, and therefore have two observations, one with CPC+ practice-based weights and the other with comparison practice-based weights.

[77] Some of these Medicare FFS beneficiaries live in the seven state-HRR combinations that include both CPC+ and comparison practices and are counted in both the 7 million and 19 million beneficiaries in the CPC+ and comparison regions, respectively.

[78] The seven state-HRRs containing both CPC+ and comparison practices have duplicate observations, one with CPC+ practice-based weights and the other with comparison practice-based weights.

[79] The seven state-HRRs containing both CPC+ and comparison practices have a total of 2,880 observations (1,440 multiplied by 2).

We applied track-specific weights to each observation with the goal of weighting the sample to represent the age, race, and sex and regional distribution of beneficiaries in the 2020 ITT analysis sample. We applied three track-specific weights to each observation, as follows:

1. All observations within a state-HRR receive a weight that accounts for the share of beneficiaries contributed by that state-HRR to the total number of CPC+ or comparison beneficiaries in the intent-to-treat (ITT) analysis sample for 2020, by track.[80]
2. All observations belonging to a particular age-race-sex combination receive a weight that accounts for the share of beneficiaries contributed by that age-race-sex cell to the total number of CPC+ or comparison beneficiaries in the ITT analysis sample for 2020, by track.
3. All observations in a comparison group state-HRR receive a weight based on the matching weights of comparison group practices in that state-HRR, by track.

The final track-specific weights for each observation in the regression are a product of these three weights. Results were very similar with and without weighting.

Outcomes. We analyzed the death rate in the state-HRR during each month using information on date of death from the Medicare enrollment data.

Control variables. We controlled for the age, race, and sex distribution of Medicare beneficiaries living in the state-HRR during the month.

B. Regression approach

In this section, we describe the model specification used to estimate excess deaths. In these regression models (one for each track), we adjusted for age, race, and sex to account for regional demographic differences. In equation (5.D.1), let s index the state, h index the hospital referral region (HRR), and c index whether the region (defined as the combination of state and HRR) contains CPC+ or comparison practices.[81] Further, let a index age, r race, and g sex of the Medicare FFS beneficiaries living in the state-HRR. Finally, let m index the month of year t, with t ranging from 2016 to 2020.

$$y_{shmtcarg} = \gamma 1_{(c=1)} + \kappa_m + \delta t + \sum_{x=1}^{12} \phi_x 1_{(t=2020, m=x)} + 1_{(c=1)} \sum_{x=1}^{11} \tau_m 1_{(m=x)} + \beta 1_{(c=1)} t + 1_{(c=1)} \sum_{x=1}^{12} \lambda_x 1(t = 2020, m = x) + f(a, r, g) + \varepsilon_{shcargmt} \quad \text{(5.D.1)}$$

where

[80] These weights are based on the state-HRR of the beneficiary's attributed practice for CPC+ or comparison beneficiaries in the ITT analysis sample for 2020, which may or may not differ from the state-HRR where the beneficiary resides.

[81] The seven state-HRRs with both CPC+ and comparison practices have duplicate observations, one with CPC+ practice-based weights and the other with comparison practice-based weights.

$y_{shmtcarg}$ represents death rates in state *s* and HRR *h* by treatment status *c* among Medicare FFS beneficiaries of age *a*, race *r*, gender *g* in month *m* of year *t*.

γ is the fixed effect for state-HRRs that contain CPC+ practices.

κ_m denotes fixed effects for calendar months that capture seasonality in deaths (with January as the reference month).

δ is the coefficient on a linear time trend *t* in years.

ϕ_x are fixed effects for each month *x* of 2020 that captures any deviations from month-specific historical trends in 2020.

The next set of terms interact month fixed effects, linear time trend, and fixed effects for each month of 2020 with the fixed effect for state-HRRs that contains CPC+ practices.

τ_m captures the deviations in usual death rate seasonality across calendar months *m* for state-HRRs that contain CPC+ practices.

β allows for the linear time trend in years to be different for state-HRRs that contain CPC+ practices and state-HRRs that contain comparison practices.

λ_x allows for the deviations from the historical trend in each month *x* of 2020 to also be different for state-HRRs that contain CPC+ practices and state-HRRs that contain comparison practices.

$f(a,r,g)$ consists of indicators for each age group (0–64, 65–74, 75–84, and 85+), race (White, Black, and all other), being male, interactions between each of these indicators with year *t*, interactions between each of these indicators with calendar months indicators (κ_m), and interactions between each of these indicators with each month of 2020, where the last set of interactions allows the deviations from month-specific historical trends in 2020 to be age-, race-, and gender-specific.

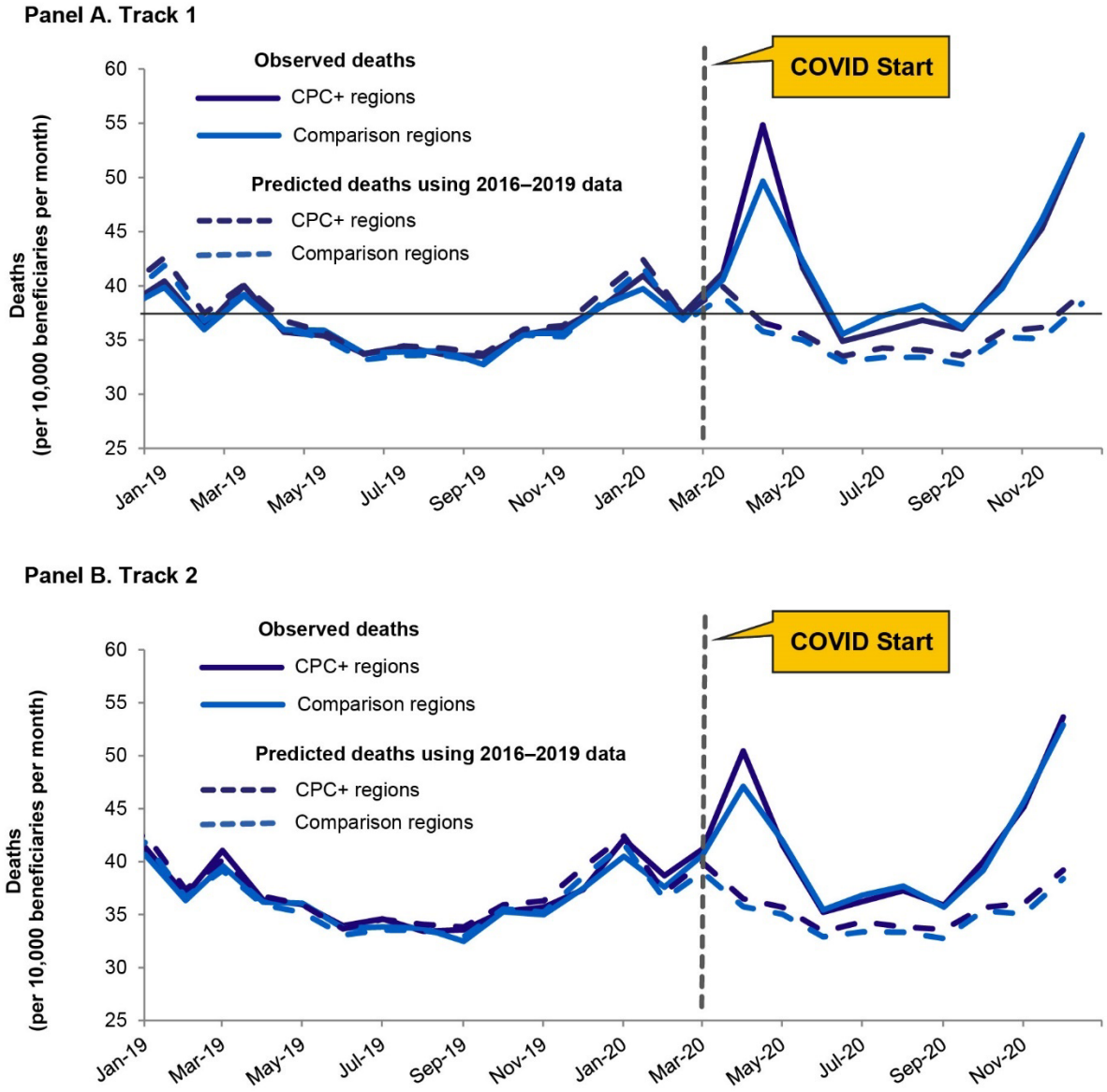
$\varepsilon_{shcargmt}$ is the idiosyncratic error term. It represents unexplained variability in the outcome variable for state *s* and HRR *h* by treatment status *c* among Medicare FFS beneficiaries of age *a*, race *r*, and gender *g* in month *m* of year *t*.

Standard errors are heteroskedasticity robust (Huber-White standard errors). In equation (5.D.1), the coefficient λ_x captures the monthly difference in excess deaths between CPC+ and comparison regions. In the results presented in Table 5.D.1, we estimated a version of the model with a single λ capturing the average deviation in the historical trends for all months after the COVID-19 pandemic started (March through December 2020).

C. Trends in deaths in CPC+ and comparison regions

Predicted deaths using the regression model described in the previous section were very similar to observed deaths prior to 2020 and then diverged sharply after the start of the COVID-19 pandemic (Figure 5.D.iii, comparing dashed and solid lines). Relative to comparison regions, CPC+ regions had greater increases in deaths in April 2020 and smaller increases in mortality in July and August 2020 (Figure 5.D.iii, comparing green and black solid lines). These differences between CPC+ and comparison regions' excess deaths were larger in regions weighted to represent Track 1 practices (Panel A) than in regions weighted to represent Track 2 practices (Panel B).

Figure 5.D.iii. CPC+ regions[a] had greater increases in deaths during April 2020, and smaller increases in deaths during July and August than comparison regions, relative to predicted deaths if the COVID-19 pandemic had not occurred



Source: Mathematica's analysis of Medicare enrollment data from January 2016 through December 2020.

Figure 5.D.iii *(continued)*

Note: Predicted deaths are based on models that are regression-adjusted for the distribution of age, race, and sex in the region. The models use data from 2016 through 2019 and project trends out through 2020 to predict deaths if the COVID-19 pandemic had not occurred. For calculating predicted deaths, we used observations at the state and HRR, month, year, age group, race, and sex levels. Each observation was weighted based on (1) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that state-HRR, by track; (2) the share of the 2020 ITT sample of CPC+ or comparison beneficiaries in that age-race-sex cell, by track; and (3) the matching weights of comparison group practices in a state-HRR, by track.

[a] Regions are defined as the combination of state and HRR.

CPC+ = Comprehensive Primary Care Plus; FFS = fee for service; HRR = hospital referral region.

Supplement 3: Creating an excess deaths regional control variable

This supplement provides detailed methods and additional results for creating a regional measure of excess deaths. As in Supplement 2, we estimated excess deaths as the difference between observed deaths in March through December 2020 and predicted deaths given historic trends from 2016 through 2019. While the goal of the analyses presented in Supplement 2 was to compare excess deaths in CPC+ and comparison regions, the goal of the analyses presented in this supplement was to create a best estimate of excess deaths by region that can be used as a control variable in the impact analysis. Given this different objective, the methods presented in this supplement differ from Supplement 2 in two major ways:

1. The analyses presented here use Bayesian adjustment to "shrink" estimates of excess deaths towards the mean in a data-driven way. This provides more stable estimates of excess deaths. In regions with many cases, the number of predicted deaths will essentially equal the number of observed deaths in that region. In regions with few or no deaths, the predicted deaths will be closer to the predicted Medicare FFS death rate for the state the region is in. The state's predicted rate, in turn, will be closer to the overall average Medicare FFS death rate for states with few deaths.
2. The regression models presented here do not use control variables because the outputs of the analyses presented here—the estimated excess deaths rates—will themselves become control variables in downstream difference-in-differences regression models that will adjust for beneficiary characteristics and practice fixed effects.

This supplement proceeds by (1) describing the study population, unit of observation, and outcome; (2) providing information about the regression approach used to calculate regional excess deaths; and (3) showing a comparison of predicted excess deaths relative to observed deaths.

A. Study population, unit of observation, and outcome

Study population. Calculations of excess deaths in the Medicare FFS population include 335 state and hospital referral region (HRR) combinations (referred to as state-HRRs) containing either CPC+ or comparison practices. On average across the five years of the analysis (2016–2020), there were 25 million Medicare FFS beneficiaries included in the analysis. These 25

million Medicare FFS beneficiaries represent about 66 percent of the total Medicare FFS population.[82]

Unit of observation. The unit of observation in the regression models is the state-HRR-month-year. That is, each state-HRR has observations that correspond to the months from January 2016 to December 2020 (60 observations in total for each state-HRR). The state-HRR-month sample was constructed by taking unweighted counts of Medicare FFS beneficiaries who lived in that state-HRR during the month, according to Medicare enrollment data.

Outcomes. We analyzed the death rate in the state-HRR during each month using date of death from the Medicare enrollment data.

B. Regression approach

In this section, we describe the model specification used to estimate the regional measures of excess deaths. We used a Bayesian hierarchical logistic regression model, which uses partial pooling to "shrink" smaller regions towards the mean in a data-driven way. In equation (5.D.2), let s index the state, h index the HRR, and m index the month of year t with t ranging from 2016 to 2020.

$$\begin{aligned} y_{shmt} &\sim \text{Binomial}\left(n_{shmt}, p_{shmt}\right) \\ logit\left(p_{shmt}\right) &= \alpha_0 + \alpha_s + \alpha_{sh} + \kappa_{0m} + \kappa_{sm} + \kappa_{shm} + \beta_{mt} + \delta_0 t + \delta_s t + \delta_{sh} t \\ &\quad + \phi_{0m2020} + \phi_{sm2020} + \phi_{shm2020} \end{aligned} \quad (5.D.2)$$

where

y_{shmt} represents the number of deaths in state s and HRR h in month m of year t.

n_{shmt} is the number of Medicare FFS beneficiaries residing in state s and HRR h in month m of year t.

p_{shmt} is the death rate in state s and HRR h in month m of year t.

α_0 is an intercept term estimating the average national death rate.

α_s denotes a series of state-level random intercepts, allowing the average death rate to vary by state.

[82] The Medicare FFS population included about 38 million beneficiaries each year from 2016–2020. See https://www.kff.org/medicare/state-indicator/total-medicare-beneficiaries/?currentTimeframe=0&selectedRows=%7B%22wrapups%22:%7B%22united-states%22:%7B%7D%7D%7D&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D.

α_{sh} denotes a series of state-HRR-level random intercepts, allowing the average death rate to vary by state-HRR.

κ_{0m} denotes random effects for each of the 12 calendar months that capture national seasonality in deaths.

κ_{sm} denotes random effects that allow for state-level seasonality that differs from national seasonality.

κ_{shm} denotes random effects that allow for state-HRR-level seasonality that differs from state and national seasonality.

β_{mt} denotes random effects for each of the 60 months in the sample, capturing national monthly death rates that differ from a typical year's seasonality.

δ_0 is the coefficient on a national linear time trend *t* in years.

δ_s denotes a series of state-level random linear time slopes, that allow a state's linear trend in death rates to differ from the national average.

δ_{sh} denotes a series of state-HRR-level random linear time slopes, that allow a state-HRR's linear trend in death rates to differ from the average in the state.

ϕ_{0m2020} denotes a series of random effects for each month *m* of 2020 from March to December that captures national deviations from month-specific historical trends during the pandemic.

ϕ_{sm2020} denotes a series of random effects for each state *s* and month *m* of 2020 from March to December that captures state deviations from the month-specific national average during the pandemic.

$\phi_{shm2020}$ denotes a series of random effects for each state-HRR *sh* and month *m* of 2020 from March to December that captures state-HRR deviations from the month-specific state average during the pandemic.

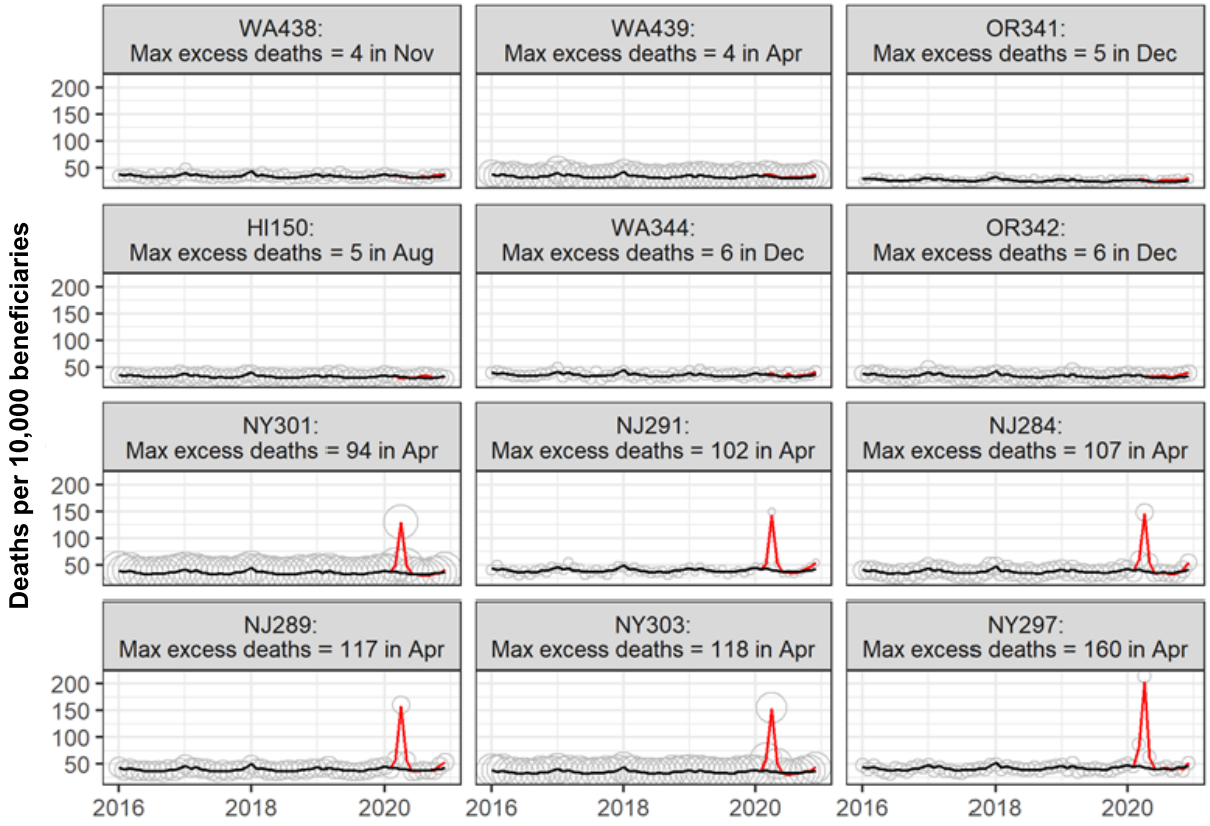
We estimated the excess deaths for each state *s* and HRR *h* in each month *x* as $\phi_{0x} + \phi_{sx} + \phi_{shx}$, that is, the sum of the national excess mortality rate for the month, plus the state excess mortality rate for the month, plus the state-HRR excess mortality rate for the month.

C. Excess deaths estimates

As shown in Figure 5.D.iv, using Bayesian methods allowed us to smooth noisy estimates of deaths for small regions (for example, see the small state-HRR "NC144" in Figure 5.D.iv) while

still very accurately capturing peaks in deaths due to COVID-19 (see how closely the peaks in red lines overlap with circles in Figure 5.D.iv).[83]

Figure 5.D.iv. Predicted deaths using Bayesian random effects models are very similar to observed deaths when sample sizes are large and appropriately different when sample sizes are small: predicted and observed death rates for 12 example regions with the lowest and highest peak excess deaths in 2020



Source: Mathematica's analysis of Medicare enrollment data from January 2016 through December 2020.

Note: The red lines represent predicted deaths during the COVID-19 pandemic using a random effects model, the black lines represent predicted deaths if the COVID-19 pandemic had not occurred (using only data from 2016 through 2019 to predict deaths in 2020) using the same random effects model, and the circles represent observed deaths, with larger circles denoting that more beneficiaries were included in the observed rates. The titles on the individual plots correspond to the state abbreviations, followed by the three-digit HRR codes. The graph shows that the predicted estimates during the COVID-19 pandemic are very similar to those observed. For smaller regions like OR341, the random effects model "shrinks" the predicted estimates toward the mean in a data-driven way.

HI = Hawaii; NJ = New Jersey; NY = New York; OR = Oregon; WA = Washington.

[83] The Bayesian model was fit with the probabilistic programming language Stan (Stan Development Team. 2019. Stan Modeling Language Users Guide and Reference Manual, 2.27. https://mc-stan.org). For the analyses included in this appendix, 10 iterations out of 16,000 posterior draws had divergent transitions— an issue that could affect predictive performance—however, the remainder of this report includes excess mortality control variables fit with updated models that did not have any divergent transitions. This computational challenge had a negligible impact on the death rate estimates used in this appendix.

Supplement 4: Additional results for total effects of COVID-19

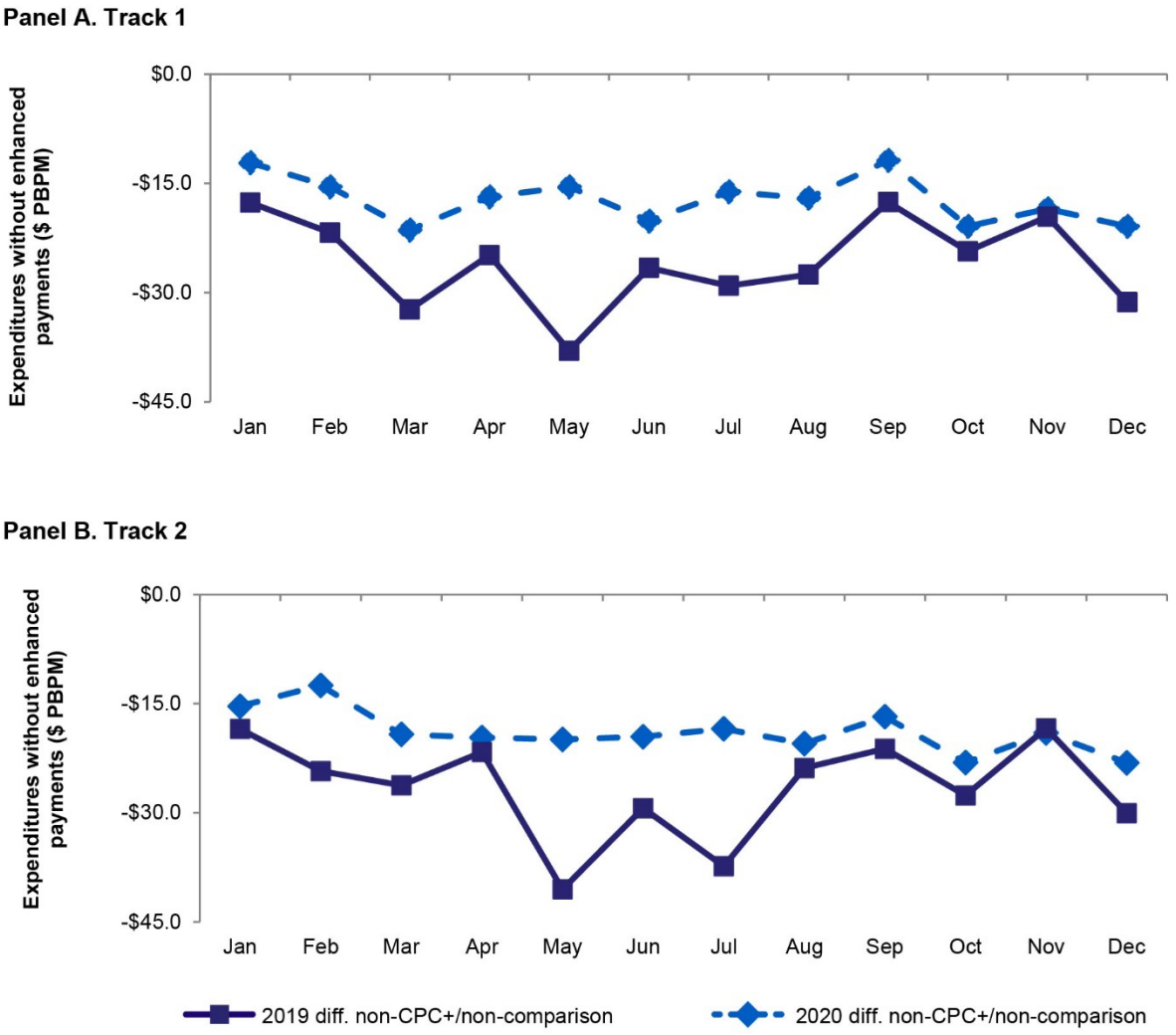
This supplement provides additional results from examining the total effects of COVID-19 on health care utilization and Medicare expenditures, and a supplemental analysis of changes in the composition of the practice and beneficiary samples due to COVID-19. The first set of results shows trends over time in the differences in claims-based outcomes, including Medicare expenditures, acute hospitalizations, and outpatient ED visits, between unselected practices in CPC+ and comparison regions. The second set of results compares the number of claims and expenditures for CPC+ and comparison regions using county-level Medicare claims data from the ASPE. Finally, the third set of results are from checking whether the practice and beneficiary samples changed differentially in the CPC+ versus the comparison group due to COVID-19.

A. Additional claims-based outcome results

As described in Appendix Section 5.D.3, nonparticipating practices in CPC+ regions experienced 1 percent lower Medicare expenditures in 2020. Figure 5.D.v shows the temporal patterns of these differences, with the largest difference in Medicare expenditures between unselected practices in CPC+ and comparison regions occuring in May 2020. The temporal patterns were similar for hospitalizations and outpatient ED visits. The concentration of differences early in the pandemic (between March and May) suggests the importance of a sensitivity analysis excluding these months from the CPC+ impact analysis.

The 2019 observations in this figure point to pre-existing differences between unselected practices in CPC+ versus comparison regions, which may reflect a lack of balance between these two groups at baseline. Unselected practices were not explicitly matched at baseline. However, they were weighted to represent the state and hospital referral region (HRR) of the CPC+ and comparison practices that were matched on baseline characteristics and were well-balanced on these outcomes at baseline. Because they were not explicitly matched, beneficiary and practice characteristics are likely to differ between unselected practices in CPC+ and comparison regions, driving these observed differences in outcomes.

Figure 5.D.v. Nonparticipating practices in CPC+ regions had lower Medicare expenditures than unselected practices in comparison regions in 2020, with the largest difference in May



Source: Mathematica's analysis of Medicare Part A and B claims data from January 2019 through December 2020.

Note: Lines show differences in Medicare expenditures between nonparticipating practices in CPC+ and unselected practices in comparison regions. The light blue dashed line shows differences in 2019 and the dark blue solid line shows differences in 2020. The differences between the average of the two lines are equal to the difference-in-differences estimates shown in Table 5.D.3. We used a concentration weight constructed at the state-HRR level, such that non-CPC+ practices had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and non-comparison practices had the same level of representation as comparison practices in the same state and HRR. Non-CPC+ and non-comparison practices were not matched or weighted by beneficiary or practice characteristics.

CPC+ = Comprehensive Primary Care Plus; PBPM = per beneficiary per month; HRR = hospital referral region.

B. ASPE's county-level Medicare claims data

We used county-level data from ASPE to investigate differences in claims and expenditures for Medicare FFS beneficiaries living in CPC+ and comparison regions. We weighted county-level data to represent the regional distribution of Track 1 or Track 2 CPC+ or comparison practices and used matching weights for comparison practices. Expenditures declined by 8.4 percent in CPC+ regions and 6.7 percent in comparison regions—a 1.5 percentage point difference—after weighting regions to represent Track 1 (Table 5.D.ii). After weighting regions to represent Track 2, declines in expenditures were similar for CPC+ and comparison regions (7 percent for both). We found no statistically significant cumulative differences in the 2019 to 2020 change in total claims per beneficiary or expenditures per claim between CPC+ and comparison regions. Utilization dropped significantly in March and recovered to pre-pandemic levels by August.

Table 5.D.ii. CPC+ regions experienced a modestly greater reduction in expenditures from 2019 to 2020 than Track 1 comparison regions, but no other differences in claims and expenditures were statistically significant

	Track 1				Track 2			
	CPC+ region mean	Comparison region mean	CPC+ vs. comparison region difference in 2020 relative to 2019 Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]	CPC+ region mean	Comparison region mean	CPC+ vs. comparison region difference in 2020 relative to 2019 Estimate (SE)	Percentage difference relative to 2019 comparison mean[a]
Expenditures per beneficiary per week								
Jan 2019–Dec 2019	$250	$257	-$3.7* ($2.0)	-1.5%	$256	$259	-$1.6 ($1.7)	-0.6%
Jan 2020–Dec 2020	$229	$240			$237	$241		
Claims per beneficiary per week								
Jan 2019–Dec 2019	1.3	1.2	-0.03 (0.02)	-2.4%	1.3	1.2	0.02 (0.03)	1.7%
Jan 2020–Dec 2020	1.1	1.1			1.2	1.1		
Expenditures per claim								
Jan 2019–Dec 2019	$204	$210	-$0.4 ($1.5)	-0.2%	$211	$211	-$1.7 ($1.7)	-0.8%
Jan 2020–Dec 2020	$220	$226			$224	$226		

Source: Mathematica's analysis of county-level claims data for all Medicare FFS beneficiaries aggregated by ASPE from January 2019 through December 2020.

Note: We aggregated daily, county-level data on the number of claims, total expenditures of claims, and average expenditures per claim to the weekly, county level. Each CPC+ or comparison practice was assigned its county-level outcomes. Each observation was weighted based on (1) the share of CPC+ or comparison beneficiaries in that county at baseline (2016), by track and (2) the matching weights of comparison group practices in the county, by track. All per-beneficiary measures are scaled based on 2019 county-level Medicare FFS beneficiary enrollment counts. We omit data for Vermilion County, IL, Pima County, AZ, and Franklin County, OH, for which 2019 claims data are unreliable.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the difference-in-differences estimate by the unadjusted 2019 comparison mean for the outcome.

ASPE = Assistant Secretary for Planning and Evaluation; CPC+ = Comprehensive Primary Care Plus; FFS = fee-for-service; SE = standard error.

C. Impact on analysis sample composition

To understand potential effects of COVID-19 on practice closure and practice compositional changes during 2020, we examined trends in the number of practices and practitioners for both the CPC+ and comparison groups over time, using IQVIA data on practice composition. Over the five-year period, trends in the number of practices (a general decline) and practice size (an increase in the number of primary care practitioners) were similar for CPC+ and comparison practices (Table 5.D.iii). Changes between 2018 and 2019 are likely explained by the change in IQVIA's source data from SK&A (2016–2018) to OneKey (2019–2020). We did not see any noticeable difference in the number or proportion of CPC+ and comparison practices exiting the sample between 2019 and 2020 relative to historic trends, which suggests that COVID-19 might not have had a major effect in terms of practice closures or mergers in our evaluation sample. For example, 11 practices (0.4 percent) fell out of the CPC+ sample between 2019 and 2020, and similarly 11 practices (0.4 percent) fell out of the CPC+ sample between 2017 and 2018.

Table 5.D.iii. The numbers of practices and primary care practitioners in 2020 are in line with historic trends, with large changes from 2018 to 2019 likely explained by changes to the data source

	2016	2017	2018	2019	2020
CPC+ practices					
Number of practices	2,888	2,875	2,864	2,720	2,709
Primary care practitioners	12,404	12,970	13,421	17,285	17,819
PCPs per practice	4.30	4.51	4.69	6.35	6.58
Comparison practices					
Number of practices	6,921	6,782	6,723	6,060	5,969
Primary care practitioners	28,302	28,673	29,437	38,156	39,798
PCPs per practice	4.09	4.23	4.38	6.30	6.67

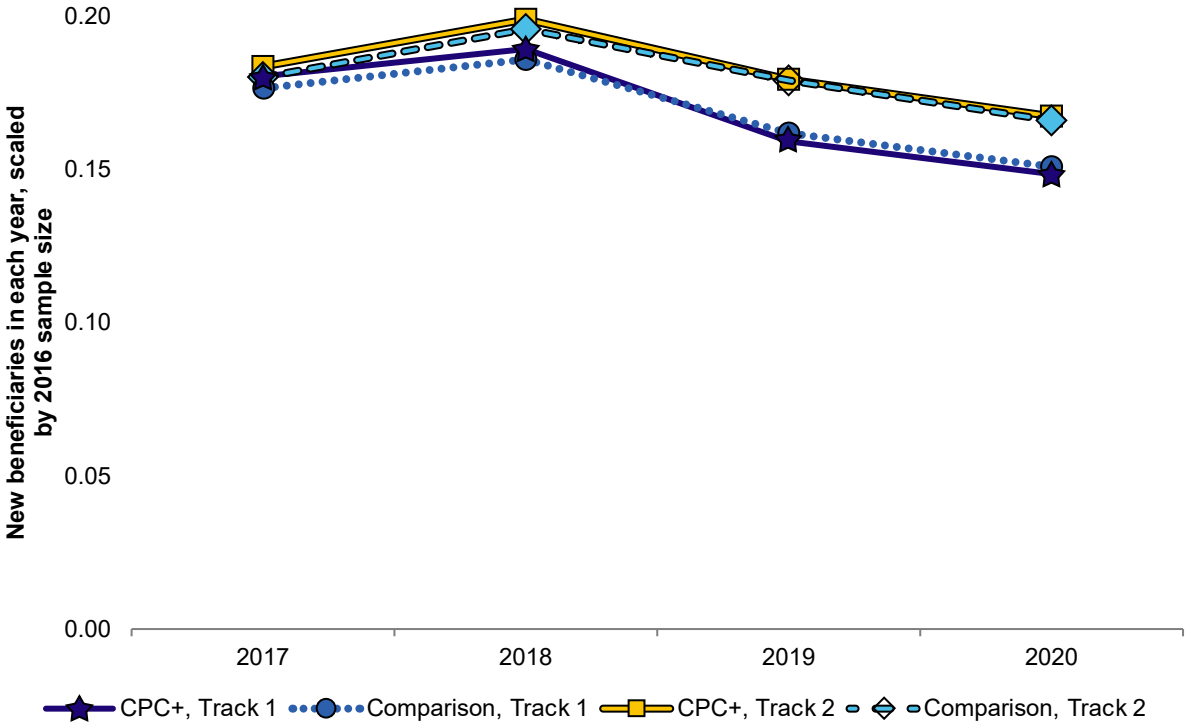
Source: 2016, 2017, and 2018 SK&A data; 2019 and 2020 OneKey data.

Note: For 148 CPC+ practices we could not identify in the 2016 SK&A data, we used information from practice rosters for all years. All statistics are unweighted. Practices fall out of the sample if they are not found in the 2017 or 2018 SK&A data or the 2019 or 2020 OneKey data. Because of our intent-to-treat design, we do not remove CPC+ practices that withdraw from CPC+.

CPC+ = Comprehensive Primary Care Plus; PCP = primary care practitioner.

In addition, we examined the number of beneficiaries added to the sample each year to track changes in our beneficiary-level sample composition over time (Figure 5.D.vi). We scaled the new beneficiary counts in each track and treatment group by their 2016 sample size for comparability across groups. Fewer beneficiaries were added in 2020 than in previous years, but the difference in new beneficiaries was relatively small and similar in magnitude for CPC+ and comparison groups. The small decrease in the number of beneficiaries added in 2020 may be explained by fewer primary care visits (which could in turn lead to fewer beneficiaries newly assigned to practices) during the pandemic.

Figure 5.D.vi. Fewer new beneficiaries were added to the sample in 2020, but trends were similar for CPC+ and comparison practices



Source: Mathematica's analysis of Medicare claims data from January 2016 through December 2020.

Note: Counts of new beneficiaries added to the sample are scaled by the group's 2016 sample size. Beneficiaries could be added to the sample if they switched from health maintenance organizations, newly enrolled in Medicare Part A and B, newly had Medicare as their primary payer, or were newly assigned to CPC+ or comparison practices in the reference year.

CPC+ = Comprehensive Primary Care Plus.

Supplement 5: Detailed methods for approaches to account for any differences due to COVID-19

This supplement provides detailed methods for the two approaches we considered to account for any differences in evaluation outcomes that may be due to COVID-19. This supplement proceeds by (1) describing the study population, unit of observation, outcomes, and controls used in the two approaches; (2) providing information about the regression approach used to calculate differences between CPC+ and comparison practices with and without COVID-19-related controls; and (3) providing information about the triple-differences regression approach used to calculate differences between unselected practices in CPC+ and comparison regions with and without COVID-19-related controls, and differences between CPC+ and comparison practices under a triple-differences approach.

A. Study population, unit of observation, outcomes, and controls

Study population. We applied the regression models to the 2017 CPC+ Starters and comparison regions. The sample includes Track 1 and Track 2 CPC+ and comparison practices as well as unselected practices in Track 1 and Track 2 CPC+ and comparison regions.

Unit of observation. The unit of observation in the regression models is the practice-month-year. That is, each practice has observations that correspond to the months from January 2019 to December 2020 (24 observations in total for each practice). The practice-month-year sample was constructed by aggregating beneficiary-month observations, including enrollment and outcomes of interest, to assigned practices. Aggregation to the practice level was done to reduce the time it takes to run the models. We included Medicare FFS beneficiaries in the ITT analysis sample who were eligible during a given month from 2019 to 2020 and were assigned to one of the four practice types included in the analysis (CPC+, comparison, nonparticipating practices in CPC+ regions, and unselected practices in comparison regions). In the aggregation process, we weighted beneficiaries assigned to comparison practices by a matching weight, which ensures CPC+ and comparison groups baseline characteristics are comparable. For beneficiaries in nonparticipating practices in CPC+ regions or unselected practices in comparison regions, beneficiaries were weighted by the concentration of CPC+ and comparison practices in the same state and HRR prior to practice-level aggregation, which ensures nonparticipating practices in CPC+ regions had the same level of representation (in terms of beneficiary months) as CPC+ practices in the same state and HRR, and unselected practices in comparison regions had the same level of representation as comparison practices in the same state and HRR.[84]

Outcomes. We analyzed three key outcomes for Medicare FFS beneficiaries:

- Medicare expenditures without CMS's enhanced payments, in dollars per beneficiary per month
- Annualized number of acute hospitalizations per 1,000 beneficiaries
- Annualized number of outpatient emergency department (ED) visits per 1,000 beneficiaries

Control variables. We include practice-level averages of beneficiary hierarchical condition category (HCC) scores, measured at the start of 2016 (the baseline period for the CPC+ impact evaluation) and, in the model described by equation (5.D.3), the following regional COVID-19-related controls:

- Excess deaths in the state-HRR averaged during each "wave" of the pandemic in 2020 (we defined waves as follows: wave 1: March–May, wave 2: June–September, wave 3: October–December)
- The maximum excess death estimate in the state-HRR and the wave of the pandemic in 2020 in which the maximum value occurred
- Pandemic Vulnerability Index, measured at the county level and averaged during each wave of the pandemic in 2020
- Government Response Index, measured at the state level using an average of the response across 2020

[84] The only exception to the balanced representation at the state-HRR level is for state-HRRs that had only CPC+ or comparison practices, in which case there is no representation of nonparticipating practices or unselected practices in those specific state-HRRs. We adjust the concentration weight for practices that are in the same state for such cases so that the representation at the state level is still balanced.

- Social Vulnerability Index, measured at the census tract level using census information from 2016

B. Regression approach—differences between CPC+ and comparison practices

In this section, we describe the model specifications used to calculate differences between CPC+ and comparison practices with and without COVID-19 controls. We begin with the description of the model we estimate for obtaining differences between CPC+ and comparison practices, shown below in equation (5.D.3). Let *j* index the practice and *t* index time, where *t* ranges from 1 to 24, with values 1 to 12 denoting the months in 2019, and values 13 to 24 denoting the months in 2020. The model takes the following form:

$$(5.D.3) \quad y_{jt} = \alpha + \gamma_t p_t + \theta z_j p_t + b_j + \beta X_j p_t + \varepsilon_{jt},$$

where

y_{jt} represents a claims-based outcome variable in practice *j*, in period *t*.

p_t (for "post 2020") is an indicator that takes the value of 1 during the months in year 2020 and 0 otherwise.

b_j is a practice-level fixed effect for practice *j*, which controls for all time-invariant practice characteristics.

z_j is a binary indicator of being a CPC+ practice; the indicator takes the value of 1 if practice *j* is a CPC+ practice and 0 otherwise. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

X_j is a vector of (1) beneficiary HCC scores measured at the start of 2016 (the baseline period for the CPC+ impact evaluation) and aggregated to the practice level and (2) COVID-19-related regional controls, if applicable. In the models with COVID-19-related controls, these also include the following variables averaged during the months within each "wave" of the pandemic in 2020: (1) excess deaths in the state-HRR of practice *j*, measured separately for wave 1, wave 2, and wave 3 of the pandemic; and (2) the Pandemic Vulnerability Index in the county of practice *j,* measured separately for wave 1, wave 2, and wave 3 of the pandemic. The model with COVID-19-related controls also includes the maximum monthly excess deaths in the state-HRR of practice *j* and the wave of the pandemic in 2020 in which the maximum value occurred, the 2020 Government Response Index in the state of practice *j,* and the 2016 Social Vulnerability

Index in the census tract of practice *j*.[85] We interact each control in X_j with the post-2020 indicator p_t. The main effects are not identified since they are collinear with the practice fixed effects.

ε_{jt} is the idiosyncratic error term. It represents the effect of the unobserved factors that can influence the outcome variable for practice *j,* during period *t*.

Standard errors are heteroskedasticity robust (Huber-White standard errors) and clustered at the practice level. For comparison-group observations, we applied weights that are equal to the product of a practice's total FFS Medicare enrollment during the given month-year, so that practices with a higher number of assigned beneficiaries receive relatively more weight than practices with fewer assigned beneficiaries in the same period, and the matching weight. For practices in the CPC+ group, we needed only the enrollment weight because the matching weight for each CPC+ practice is one. In equation (5.D.3), the coefficient θ captures the average difference in outcomes between the CPC+ and comparison groups for the months in 2020, relative to that difference in 2019, adjusting for differences in beneficiary risk scores, practice fixed effects, and COVID-19-related controls (if applicable).

C. Regression approach—triple-differences model

We turn next to describing the triple-differences model specification used to calculate differences between unselected practices in CPC+ and comparison regions with and without COVID-19 controls, and differences between CPC+ and comparison practices. Let *j* index the practice and *t* index time, where *t* ranges from 1 to 24, with values 1 to 12 denoting the months in 2019, and values 13 to 24 denoting the months in 2020. We estimated model (5.D.4) for beneficiaries assigned to CPC+ practices, comparison practices, nonparticipating practices in CPC+ regions, and unselected practices in comparison regions. The model takes the following form:

$$(5.D.4) \quad y_{jt} = \alpha + \gamma_t p_t + \theta a_j p_t + \delta s_j p_t + \mu a_j s_j p_t + b_j + \beta X_j p_t + \pi X_j p_t s_j + \varepsilon_{jt} ,$$

where

y_{jt} represents a claims-based outcome variable in practice *j*, in period *t*.

p_t (for "post 2020") is an indicator that takes the value of 1 during months in year 2020 and 0 otherwise.

b_j is a practice-level fixed effect for practice *j*, which controls for all time-invariant practice characteristics.

[85] The analyses in this Appendix use the 2016 version of the Social Vulnerability Index, but in the remainder of the report we updated to the 2018 version of the Social Vulnerability Index to more closely reflect social vulnerability during the COVID-19 pandemic.

a_j (for "area") is a binary indicator for being in a CPC+ region; the indicator takes the value of 1 if practice *j* is located in a CPC+ region and is 0 otherwise. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

s_j (for "selected") is a binary indicator of being a CPC+ or comparison practice; the indicator takes the value of 1 if practice *j* is a CPC+ practice or a comparison practice, and is 0 if practice *j* is an unselected practice. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

X_j is a vector of beneficiary HCC scores measured at the start of 2016 (the baseline period for the CPC+ impact evaluation) and aggregated to the practice level. The models with COVID-19-related controls also include the following variables averaged during the months within each "wave" of the pandemic in 2020: (1) excess deaths in the state-HRR of practice *j*, measured separately for wave 1, wave 2, and wave 3 of the pandemic; and (2) the Pandemic Vulnerability Index in the county of practice *j,* measured separately for wave 1, wave 2, and wave 3 of the pandemic. The model with COVID-19-related controls also includes the maximum monthly excess deaths in the state-HRR of practice *j* and the wave of the pandemic in 2020 in which the maximum value occurred, the 2020 Government Response Index in the state of practice *j,* and the 2016 Social Vulnerability Index in the census tract of practice *j*. We interact each control in X_j with (1) the post-2020 indicator p_t and (2) the post-2020 indicator p_t and the "selected" indicator s_j. This allows for the possibility that beneficiary characteristics might have different effects for beneficiaries in CPC+ or comparison practices than for beneficiaries in unselected practices. The main effects are not identified since they are collinear with the practice fixed effects.

ε_{jt} is the idiosyncratic error term. It represents the effect of the unobserved factors that can influence the outcome variable for practice *j,* during period *t*.

Standard errors are heteroskedasticity robust (Huber-White standard errors) and clustered at the practice level. For observations that correspond to CPC+ or comparison practices, we applied the same weights as described in Supplement 5, Section B. That is, the final weight for comparison practices was the product of the aggregated practice-level enrollment weight and the matching weight while, for practices in the CPC+ group, the final weight is equal to only the aggregated practice-level enrollment weight. For observations that correspond to unselected practices, the final weight was the product of the aggregated enrollment weight and the concentration weight. In equation (5.D.4), the coefficient θ captures the difference in outcomes between unselected practices in CPC+ and comparison regions in 2020, relative to that difference in 2019, adjusting for differences in beneficiary characteristics, practice fixed effects, and COVID-19-related controls (if applicable). In equation (5.D.4) the coefficient μ is the triple-differences estimate and captures the average difference in outcomes between the CPC+ and comparison groups for the months in 2020, relative to that difference in 2019, after netting out the difference in changes

in outcomes between unselected practices in CPC+ and comparison regions and adjusting for differences in beneficiary characteristics and practice fixed effects.

5.E. Empirical Strategy

This Appendix describes the empirical strategy used to estimate impacts on Medicare claims-based outcomes in this report. For the main impact analysis over the first four years of CPC+, we used a difference-in-differences regression analysis with a comparison group selected using propensity score matching and reweighting methods. Our sample includes practices that joined CPC+ in 2017 and were participating in CPC+ as of April 1, 2017 (the end of the first program quarter),[86] and their matched comparison practices.

In this Appendix, we first briefly describe the approach used to select the comparison group and show the similarity between the CPC+ and matched comparison practices at baseline (Section 1). We then describe the study population and unit of observation in the regressions (Section 2). We describe the regression model, including the difference-in-differences and straight-difference models (defined below) in Section 3, and discuss the interpretation of model coefficients in Section 4. We present additional details on model estimation in Section 5, followed by a description of control variables (Section 6) and weighting (Section 7). We then discuss the power to detect effects (Section 8). Finally, we describe the subgroup analyses to check for differential effects of CPC+ on practice and beneficiary subgroups (Section 9), and sensitivity tests to check for the robustness of the impact estimates (Section 10).

5.E.1. Comparison group

To estimate the impact of CPC+, we compared patient outcomes over time for CPC+ practices relative to those of similar matched comparison practices. We drew the comparison group from practices that provide primary care in regions not selected for CPC+. We selected comparison groups separately for Track 1 and Track 2, because CMS views each track as a different intervention that should be analyzed separately. We also matched practices separately within track by SSP status, because we and CMS deemed participation in SSP to be the most important practice characteristic that could affect outcomes, given that SSP practices face different payment incentives. The result was six comparison groups supporting analyses for six groups: (1) Track 1 overall, (2) Track 2 overall, (3) Track 1 SSP, (4) Track 1 non-SSP, (5) Track 2 SSP, and (6) Track 2 non-SSP. Appendix 6.C in the appendix to our second annual report (Ghosh et al. 2020) contains more details on the comparison groups.

We used propensity score matching and reweighting methods to establish a group of non-participating primary care practices that had similar practice characteristics (such as the number of practitioners and urban/rural status) and that served a similar population of Medicare fee-for-service (FFS) beneficiaries at baseline as CPC+ practices (for example, in terms of average age and expenditures during the year before CPC+ began, as shown in Table 5.E.1). We identified these characteristics from Medicare claims and enrollment data as well as other secondary data

[86] Of the 2,905 CPC+ practices that started the initiative on January 1, 2017, 17 practices (0.6 percent) withdrew in the first three months before the selection of the intent-to-treat (ITT) sample, and 2,888 practices were participating as of April 1, 2017. These 2,888 practices are in the ITT sample; we excluded the 17 practices that withdrew in the first three months because they were unlikely to have made much progress implementing CPC+ during that time.

sources such as IQVIA, CMS data on participation in Center for Medicare and Medicaid Innovation models other than CPC+, and the Area Health Resource File.

The resulting comparison groups had baseline characteristics comparable to the CPC+ practices, and differences between the CPC+ and comparison groups were negligible for almost all characteristics across both tracks (see Table 5.E.1). Details on the post-matching similarity of the CPC+ practices and their matched comparison practices, including standardized differences, by track and SSP status for the full set of characteristics that were used for matching are in our second annual report appendix (see Ghosh et al. 2020, Tables 6.C.5 to 6.C.10).

Table 5.E.1. Similarity of the CPC+ and comparison practices (practice values weighted by number of Medicare FFS beneficiaries), by track

		Track 1		Track 2	
Practice characteristics at baseline	Data source for characteristic	Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,783)
Participation in SSP ACO as of January 1, 2017 (%)	MDM January 1, 2017	51.4	52.3	44.2	44.2
Hospital ownership or health system management or ownership (%)	SK&A 2016	54.8	55.3	58.2	59.8
Participation in prior primary care transformation activities[a] (%)	Data from CMS and from organizations that offer medical home recognition	53.5	52.6	80.9	75.4
Urbanicity of practice's county					
Rural (%)	Area Health Resource File 2016	10.3	9.8	7.7	7.7
Suburban (%)	Area Health Resource File 2016	18.0	18.4	16.0	16.8
Urban (%)	Area Health Resource File 2016	71.7	71.8	76.3	75.5
Mean PBPM Medicare expenditures in 2016	EDB and claims data	$881.0	$885.0	$877.0	$879.0
Acute care hospitalizations (short-stay acute care and CAHs) in 2016 per 1,000 beneficiaries, annualized	EDB and claims data	285.4	284.0	287.4	283.5
Outpatient ED visits, including observation stays, in 2016 per 1,000 beneficiaries, annualized	EDB and claims data	493.8	498.2	492.6	492.5
Mean 2016 HCC score among beneficiaries assigned in 2016	EDB and claims data	1.1	1.1	1.1	1.1

Table 5.E.1 *(continued)*

Practice characteristics at baseline	Data source for characteristic	Track 1		Track 2	
		Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,783)
Number of primary care practitioners:					
1–2 primary care practitioners (%)	SK&A 2016	21.3	21.5	12.9	13.5
3–4 primary care practitioners (%)	SK&A 2016	23.2	24.0	22.4	22.1
5–7 primary care practitioners (%)	SK&A 2016	25.8	25.5	26.0	26.3
8+ primary care practitioners (%)	SK&A 2016	29.8	29.0	38.7	38.1
Practice is multispecialty[b] (%)	SK&A 2016	19.6	20.1	26.2	26.2
Hospital Referral Region price index	CMS's Medicare Geographic Variation data, 2015	1.1	1.1	1.0	1.1
Meaningful EHR use[c] (%)					
Never attested (%)	CMS's Medicare EHR Incentive Program data	8.0	8.5	3.5	3.7
Attested since 2011 or 2012 (%)	CMS's Medicare EHR Incentive Program data	78.9	78.5	88.2	87.9
Attested since 2013 or later (%)	CMS's Medicare EHR Incentive Program data	13.1	13.0	8.3	8.4
Number of Medicare FFS beneficiaries assigned in 2016 per PCP	Mathematica attribution based on SK&A roster	231.0	226.0	197.0	202.0

Source: Mathematica's analysis of baseline practice characteristic data of CPC+ and matched comparison practices.

Note: Because CPC+ is a practice-level model, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we analyzed Medicare claims-based outcomes using beneficiary-level data rather than practice-level data, so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance in the analytic sample that we used in regression analyses. Specifically, the means in this table represent practice-level means, weighted by the number of Medicare FFS beneficiaries assigned to each practice in 2016.

[a] We define prior transformation experience as CPC Classic or MAPCP participation, or whether the practice is recognized as a medical home by NCQA, TJC, AAAHC, URAC, or a state medical-home recognition program.

[b] Defined as having at least one practitioner, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[c] Defined as having at least one practitioner within the practice who attested to meaningful use under the CMS Medicare EHR Incentive Program.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = Accountable Care Organization; CAH = critical access hospital; CMS = Centers for Medicare & Medicaid Services; ED = emergency department; EDB = Medicare enrollment database; EHR = electronic health record; FFS = fee-for-service; HCC = hierarchical condition category; MAPCP = Multi-payer Advanced Primary Care Practice Demonstration; MDM = CMS master data management system; NCQA = National Committee for Quality Assurance; PBPM = per beneficiary per month; PCP =

Table 5.E.1 *(continued)*

primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

5.E.2. Study population and unit of observation in the regression analysis

A. Study population

We used a cross-sectional approach to define the study population, with highly overlapping cross-sections for (1) the baseline year and (2) each year of CPC+. The study population was based on beneficiary attribution (described in Appendix 5.A), and the annual cross-sections of beneficiaries for the baseline year and the intervention period were based on quarterly attribution (see Table 5.E.2 below).

Table 5.E.2. Baseline and intervention year cross-section definitions for study population

Cross-section	Study population definition Beneficiaries attributed to CPC+ or comparison practices at any time during the…
Baseline	Baseline year (January 1, 2016, to December 31, 2016)
First intervention year	First intervention year (January 1, 2017, to December 31, 2017)
Second intervention year	Second intervention year (January 1, 2018, to December 31, 2018)
Third intervention year	Third intervention year (January 1, 2019, to December 31, 2019)
Fourth intervention year	Fourth intervention year (January 1, 2020, to December 31, 2020)

B. Assignment to the CPC+ or comparison group, based on attribution

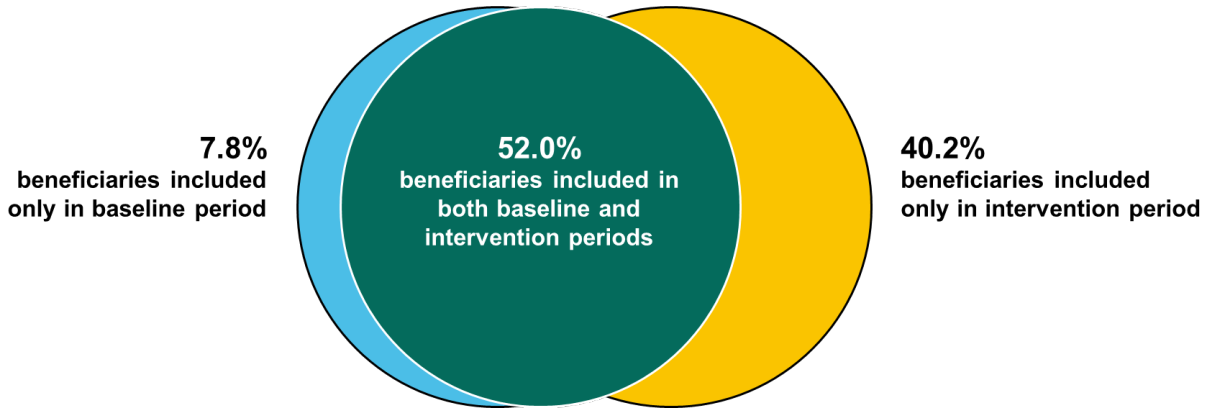
We assigned beneficiaries to the CPC+ or comparison group at two points:

1. For the **baseline period**, we assigned beneficiaries to the CPC+ or comparison group based on the first practice they were attributed to during the baseline period.
2. During the **intervention period**, we assigned beneficiaries to the CPC+ or comparison group based on the first CPC+ or comparison practice they were attributed to during the intervention period; following an intent-to-treat (ITT) approach, we continue to assign the beneficiary to the same practice for the entire intervention period, regardless of whether the beneficiary continued to receive care at that practice as long as they are observable in Medicare Part A and B claims data.

Following these definitions, it is possible for a beneficiary to be in the study population (1) only during the baseline period—for example, if the beneficiary died during the baseline period or was no longer attributed to a CPC+ or comparison practice during the intervention period; or (2) only during the intervention period—for example, if the beneficiary was first attributed to a CPC+ or comparison practice during an intervention year (including people who were new to Medicare). We found that 52 percent of beneficiaries were included in both the baseline and intervention periods in our main impact analysis, whereas 7.8 and 40.2 percent, respectively, were included for only the baseline year and only the intervention years (Figure 5.E.1). Because we are retaining beneficiaries in the study population over time (following the ITT approach), as well as adding new beneficiaries to the sample, the sample size during the intervention period

will continue to grow as we add more intervention years to the analysis and will include more new beneficiaries compared to the baseline period. Therefore, the percentage of beneficiaries in the full sample—which covers both the baseline and intervention periods—who are only in the baseline period will fall over time, while the percentage of beneficiaries who are only in the intervention period will increase over time.

Figure 5.E.1. Overlap of beneficiaries in the baseline and intervention periods



Source: Overlap of assigned Medicare FFS beneficiaries in Mathematica's evaluation sample for the first four program years and in the year before the start of CPC+ using Medicare claims data from January 2014 to December 2020.

Given the ITT approach to assignment, beneficiaries cannot switch practices *during* the baseline period or *during* the intervention period. This rules out any contamination of the comparison group during the intervention period. However, going from the baseline to the first year of the intervention period, changes in the beneficiary sample at a practice can occur due to:

1. Beneficiaries switching practices—within the CPC+ or comparison group or across groups—since the ITT rule is applied separately in each period. This does not pose a risk of contamination since there was no intervention during the baseline period. Also, practice switches between the baseline and intervention periods are most likely to occur *within* the CPC+ or comparison group, given that we use external comparison regions for matching.
2. Adding beneficiaries who are newly attributed to a CPC+ or comparison practice and found to be eligible.
3. Excluding previously attributed beneficiaries who are no longer eligible (e.g., due to death or enrollment in a Medicare Advantage [MA] plan).

During the intervention period, changes in the beneficiary sample at a practice can occur across years only due to the second and third reasons.

There are two advantages to using an ITT approach for this analysis:

1. It avoids potential biases in impact estimates that could result if CPC+ affects who is attributed to practices over time or which practices are in the sample. For example, through practices' implementation of CPC+ components like care management, enhanced access, and care coordination, patients in CPC+ practices may be more likely to find a "home" in their

CPC+ practice, leading to fewer patients, particularly high-risk patients, switching practices relative to the comparison practices. Thus, in the absence of the ITT approach, we would erroneously estimate that CPC+ increased Medicare expenditures simply because CPC+ practices retained more high-risk patients than the comparison practices. Another example would be if practices stopped treating certain types of beneficiaries due to CPC+ financial incentives, the ITT approach would continue to assign those beneficiaries to the originally attributed CPC+ practices in the following intervention years. CPC+ could also affect whether practices merge, split, or close, for example, by providing enhanced payments.

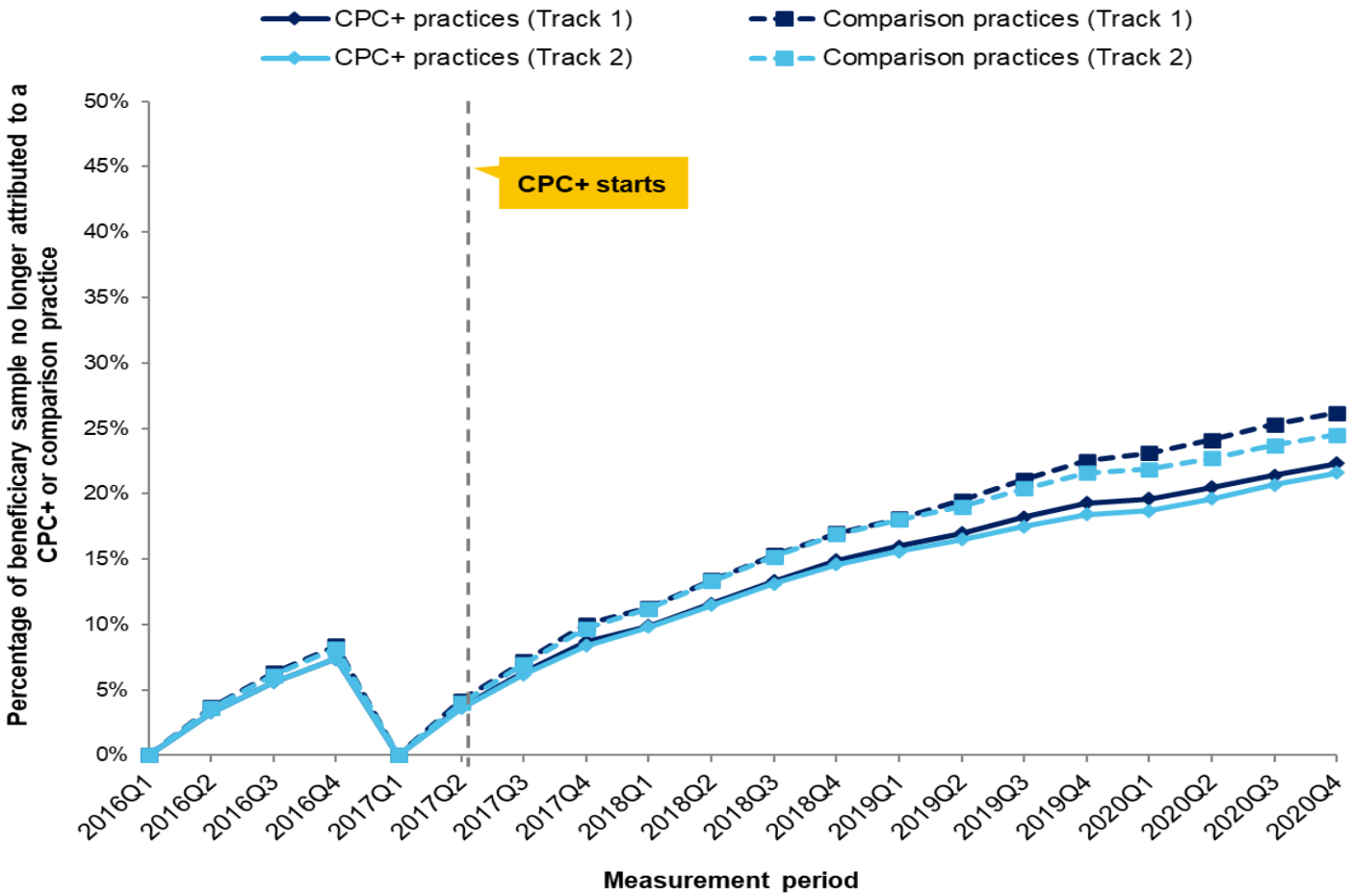
2. Beneficiaries might continue to benefit from new or improved services they receive from CPC+ practices, even after switching to non-participating practices. A non-ITT approach would miss these effects of CPC+ and potentially attribute them to the non-participating practices.

A disadvantage of the ITT approach is that the estimated impacts of CPC+ could be diluted compared to what would happen if we followed a set of beneficiaries that continuously received care from CPC+ practices. Figure 5.E.2 shows the percentage of beneficiaries who were no longer attributed to a CPC+ or comparison practice during the quarter but were retained after being attributed in a previous quarter, due to the ITT approach. In the first quarter of the baseline period and the first quarter of the intervention period, all beneficiaries in the analytic sample were also originally attributed to a CPC+ or comparison practice by design (since ITT is not applicable in the first quarter of each period). By the last quarter of Program Year (PY) 4 (2020), for both Tracks 1 and 2, about 22 percent of beneficiaries in CPC+ practices were no longer attributed to a CPC+ practice but were still in the research sample; about 26 percent of beneficiaries in Track 1 and 25 percent of beneficiaries in Track 2 were no longer attributed to a comparison practice but were still in the research sample. This finding suggests that, over time, a slightly higher proportion of beneficiaries in CPC+ practices continued receiving billable care from the same practices, and therefore continued to be attributed to the same practices, than the proportion of beneficiaries in comparison practices.[87] We conducted a sensitivity analysis for our primary outcome, Medicare expenditures without enhanced payments, that dropped beneficiaries

[87] There are many factors that could contribute to this growing difference in the proportion of beneficiaries who remain attributed to CPC+ versus comparison practices, but we cannot fully measure the extent to which the difference is caused by CPC+. CPC+ might make it more likely for beneficiaries to continue to obtain care from the same practice, compared to comparison beneficiaries, due to changes in CPC+ practices including: providing improved patient care due to the care delivery requirements of the model, actively providing and billing for annual wellness visits, or continuing to keep their doors open due to the enhanced payments from CPC+. Differences in annual wellness visits appear to explain only a small amount of the CPC+ and comparison differential–for example, the addition of this criterion in 2019 led to a 2.5 percent increase in attributed beneficiaries for CPC+ practices and a 2.3 percent increase for comparison beneficiaries through 2018, leaving a small net differential. Other factors that might contribute to differences between CPC+ and comparison practice beneficiaries being attributed to the same practice could be unrelated to CPC+. For example, there could be selection bias in the model: CPC+ practices presumably would not have applied to CPC+ if they knew they were about to close or their practitioners were about to retire; unfortunately, our evaluation matching design did not include variables such as practitioner age that could have helped mitigate selection bias that leads to differential attrition. Another contributing factor could be data quality issues: since CPC+ practices applied to participate in CPC+, practices in IQVIA rosters that we have identified as the CPC+ practices are less likely to be determined as "erroneous" by IQVIA (as they clean and revise their data) and to disappear from their rosters over time than comparison practices.

from the sample when they are no longer attributed to a CPC+ or comparison practice. (See Section 5.E.10 for a more detailed description of this analysis.)

Figure 5.E.2. Percentage of beneficiaries in the analytic sample who were no longer attributed to a CPC+ or comparison practice but remained in the research sample due to the ITT approach, by track



Notes: The numbers in this figure represent the percentage of beneficiaries who were no longer attributed to a CPC+ or comparison practice but were retained in the analytic sample due to the ITT sample construction approach. We conduct assignment separately in the baseline and intervention periods. In the first quarter of the baseline period (2016Q1) and in the first quarter of the intervention period (2017Q1), the sample includes only beneficiaries actually attributed during these quarters. In subsequent quarters, beneficiaries remain in the sample even if they are no longer attributed to a CPC+ or comparison practice. Therefore, the percentage of beneficiaries not attributed is zero in 2016Q1 (and then increases over the baseline period) and is zero again in 2017Q1 (and then increases over the intervention period). This figure does not account for attrition among CPC+ practices. That is, beneficiaries attributed to a practice that stopped participating in CPC+ are still considered as being attributed to a CPC+ practice. Approximately 11 percent of CPC+ practices were terminated by CMS or withdrew during the first four years of CPC+.

ITT = intent-to-treat; Q = quarter.

C. Sample size

For Track 1, the main analyses included 1,446,195 unique Medicare FFS beneficiaries served by 1,373 CPC+ practices and 4,935,793 unique beneficiaries served by 5,243 matched comparison practices during either the baseline period or the first four program years.[88]

For Track 2, the main analyses included 1,762,047 unique Medicare FFS beneficiaries served by 1,515 CPC+ practices and 4,173,931 unique beneficiaries served by 3,783 matched comparison practices during either the baseline period or the first four program years.

D. Unit of observation

The unit of observation in the regressions for all claims-based outcomes (other than the 30-day readmissions and the unplanned acute care outcomes) is the beneficiary-year. Each beneficiary has observations for as many years as the beneficiary remains in the sample (as defined above) and can still be observed in claims. Specifically, to be observed, a beneficiary assigned to a practice for the baseline or the intervention period had to be alive, have both Medicare Part A and B FFS coverage with Medicare as the primary payer, and not be covered under a Medicare Advantage or other Medicare health plan.[89] Medicare beneficiaries who were dually eligible for Medicaid will be attributed as long as they meet the other eligibility requirements.

For the 30-day readmissions and the unplanned acute care after hospitalization outcomes, for which we only included beneficiaries who had at least one eligible hospital discharge in a year, the unit of analysis is the index hospital discharge, rather than the beneficiary. So, for example, a beneficiary who has two index hospital discharges in a year has two observations in that year, one for each discharge.[90] Similarly, for the unplanned acute care after an emergency department (ED) visit or an observation stay outcome, the unit of analysis is the index ED visit or observation stay.

If CPC+ practices are more effective in keeping beneficiaries out of the hospital or the emergency room, the relative severity of index discharges (including index hospital discharges and index ED visits or observation stays) could rise for the CPC+ group compared to the comparison group over time and might include discharges that are more likely to result in a readmission or an unplanned acute care event. This change in the relative severity of index discharges could lead to higher readmission or unplanned acute care rates in the CPC+ group. To address this issue, we conducted a sensitivity test using readmission and unplanned acute care

[88] After accounting for weights that adjust for matching and time observed in Medicare FFS, the effective sample sizes in the main analysis for the baseline period are about 95 percent of the actual sample size for the CPC+ sample in both Tracks 1 and 2 and about 45 and 40 percent of the actual sample size for comparison sample in Tracks 1 and 2, respectively.

[89] As we describe in Appendix 5.A, we apply an additional criterion for a beneficiary not being incarcerated when we identify attributed patients, following CMS's approach to patient attribution. Once we attribute a patient to a CPC+ or comparison practice based on all criteria in the attribution algorithm, the final analysis ignores the "not incarcerated" requirement in identifying the number of FFS eligible months for patients.

[90] A readmission could qualify as an index stay if it meets the eligibility criteria for an index hospital admission.

measures calculated at the beneficiary level. For this test, we include all beneficiaries in the sample—even those without any index hospitalizations, or index ED visits or observation stays.

5.E.3. Model specification

In this section, we describe both the difference-in-differences model used for most outcomes and the straight-difference model (defined below) used for the telehealth and mortality outcomes. We note key differences in the estimation of the difference-in-differences model for the 30-day readmissions and unplanned acute care outcomes in Sections 5.E.4, 5.E.6, and 5.E.7.

A. Difference-in-differences model

We estimated the impact of CPC+ by using difference-in-differences regressions. Specifically, for all our beneficiary-level outcomes except for telehealth and mortality, we compared the difference in mean outcomes between beneficiaries assigned to CPC+ and comparison practices during (1) the baseline year before CPC+ (2016) and (2) each intervention year of CPC+ (Years 1 through 4), while controlling for beneficiary characteristics at baseline, COVID-19-related controls, and practice-level fixed effects. Since the impact analysis includes PY 4 or calendar year 2020, it was important to account for any differences in how the COVID-19 pandemic unfolded in CPC+ versus comparison regions. Therefore, we included COVID-19-related controls in the impact analysis, based on the detailed claims-based COVID checks that are described in Appendix 5.G. The beneficiary-level controls, COVID-19-related controls, and the practice fixed effects help to (1) adjust for beneficiary risk, (2) mitigate potential bias in PY 4 CPC+ impact estimates due to differences between CPC+ and comparison regions in the timing, severity, and effects of COVID-19 on mortality and health care use, (3) improve the precision of the model, and (4) account for any remaining imbalance in beneficiary and practice characteristics, including unmeasured and time-invariant practice characteristics at baseline.

In Equation (5.E.1), let *i* index the beneficiary, *j* index the practice, and *t* index time, where *t* ranges from 0 to 4, with 0 denoting the baseline year. Given the study population and unit of observation defined above, for the main regression analyses we estimated difference-in-differences regression models of the following form, with one regression for each outcome:

$$y_{ijt} = \alpha + \beta X_{it} + \gamma_t p_t + \theta_t z_j p_t + \delta C_j T_t + b_j + \varepsilon_{ijt}, \quad \text{(5.E.1)}$$

where

y_{ijt} represents a claims-based outcome variable for beneficiary *i*, in practice *j*, in year *t*. Outcome variables include Medicare expenditures and measures of utilization such as hospitalizations. Table 5.E.1 in Appendix 5.B lists the outcomes.

X_{it} is a vector of characteristics of beneficiary *i* measured at the start of the baseline period for baseline observations, and at the start of the intervention period for intervention period observations. For example, beneficiary characteristics include demographics (age, race, and gender), variables capturing Medicare and Medicaid eligibility (that is, original reason for Medicare eligibility, and dual Medicare-Medicaid

status), and hierarchical condition category (HCC) score. We also include beneficiary characteristics like HCC score interacted with the year indicators (from PY 2 onward) to account for possible changes in the relationship between the characteristic measured at the start of CPC+ and outcomes. We describe covariates in more detail in Section 5.E.6 below.

p_t (for "post") is an intervention-period indicator that takes the value of 1 during a specific intervention year, for instance PY 1, and 0 otherwise.

z_j is a binary indicator of intervention status or of being in a CPC+ practice; the indicator takes the value of 1 if practice *j* is a CPC+ practice, and is otherwise 0. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

C_j is a vector of COVID-19-related controls including excess deaths in the state-hospital referral region (HRR), Pandemic Vulnerability Index in the county, Government Response Index in the state, and Social Vulnerability Index in the census tract of each practice. We include COVID-19-related controls interacted with the year 2020 indicator to account for potential effects of COVID-19 on outcomes in calendar year 2020.[91]

T_t is a binary indicator for calendar year 2020; the indicator takes the value of 1 if year *t* is 2020, and 0 otherwise.

b_j is a practice-level fixed effect for practice *j*, which controls for all time-invariant practice characteristics.

ε_{ijt} is the idiosyncratic error term. It represents unexplained variability in the outcome variable for beneficiary *i*, in practice *j*, during period *t*.

B. Straight-difference model

For telehealth service use and expenditures as well as mortality, we estimated the impact of CPC+ by using straight-difference regressions, comparing the difference in mean outcomes between beneficiaries assigned to CPC+ and comparison practices during a specific observation period. We used the straight-difference model instead of the difference-in-differences model for telehealth outcomes since the use of these services was close to zero at baseline. In other words, the mean outcome in any intervention year for the CPC+ or comparison group is similar to the change in the mean outcome from baseline to that intervention year for telehealth services. In addition, we only modeled the telehealth outcomes in PY 4 because the use of these services was also close to zero in the first three intervention years. Since the probability of dying increases with the length of the observation period, we decided to model mortality over fixed lengths of follow up (for example, 12, 24, 36, and 48 months) during the intervention period with a straight-

[91] The main effects of these COVID-19-related regional controls are not identified in this equation because the model includes practice fixed effects.

difference model. We controlled for beneficiary and practice characteristics at baseline, and COVID-19-related controls (for regressions that include observations in PY 4).

In Equation (5.E.2), let *i* index the beneficiary and *j* index the practice. For the telehealth and mortality outcomes, we estimated straight-difference regression models of the following form, with a separate regression for each outcome in each intervention year:

$$(5.E.2) \quad y_{ij} = \alpha + \beta X_i + \pi z_j + \rho C_j + \mu d_j + \varepsilon_{ij},$$

where

y_{ij} represents a telehealth or mortality outcome variable for beneficiary *i* in practice *j*. Telehealth outcome variables include expenditures and number of non-face-to-face ambulatory visits with primary care practitioners and specialists in PY 4, or 2020. Mortality outcome variables include whether a patient died within 12 months since the start of the baseline period, and whether a patient died within 12, 24, 36, and 48 months since the start of the intervention period (that is, by the end of Years 1 through 4).We also looked at the fraction of days alive across 12 months since the start of the baseline period and fraction of days alive across the 12, 24, 36, and 48 months since the start of the intervention period. Table 5.E.1 in Appendix 5.C lists the telehealth outcomes and Section 5.E.1.G in Appendix 5.B lists the mortality outcomes.

X_i is a vector of baseline characteristics of beneficiary *i* as in Equation (5.E.1). For modeling telehealth outcomes, we also control for baseline Medicare expenditures and use of selected services to account for differences in health care utilization between beneficiaries assigned to CPC+ versus comparison practices before the start of CPC+. We describe the baseline Medicare expenditures and service use control variables in more detail in Section 5.E.6 below.

z_j is a binary indicator of being in a CPC+ practice as in Equation (5.E.1); the indicator takes the value of 1 if practice *j* is a CPC+ practice, and is otherwise 0.

C_j is a vector of COVID-19-related controls as in Equation (5.E.1). We included COVID-19-related controls for examining telehealth outcomes in PY 4 and the 48-month mortality outcomes that include data through PY 4.

d_j is a vector of baseline characteristics of practice *j*. We describe practice-level control variables in more detail in Section 5.E.6 below.

ε_{ij} is the idiosyncratic error term. It represents unexplained variability in the telehealth or mortality outcomes for beneficiary *i* in practice *j*.

5.E.4. Model output and interpretation of key coefficients

In Equation (5.E.1) (difference-in-differences model), the intervention period-specific coefficients (γ_t) capture changes experienced by the comparison group in each intervention-period interval. Note that, instead of assuming a linear time trend, we allowed the coefficients to vary for each interval. The set of interaction terms ($\theta_t z_j p_t$) captures the difference in outcomes between the CPC+ and comparison groups for each intervention-period interval relative to that difference in the baseline period, adjusting for differences in (observed) beneficiary and (observed and unobserved) practice characteristics that remain after matching. Thus, the θ_t coefficients are the interval-specific impact estimates that capture whether CPC+ made a difference to an outcome of interest.

By estimating Equation (5.E.1) for the impact analysis in this report, we obtained an estimate of θ_t for each year of CPC+, as well as regression-adjusted means for baseline and intervention years, by intervention status. In addition to the model specified by Equation (5.E.1), we estimated an alternative model that assumed a constant impact θ across the entire intervention period, providing an average impact estimate across the four intervention years. In the fifth annual report, we will continue to use this overall or "cumulative" impact estimate to summarize CPC+'s impact through the end of the model.

Table 5.E.3 illustrates how the parameter estimates from Equation (5.E.1) can be used to obtain the regression-adjusted CPC+ and comparison group means for the baseline year and each intervention year, along with the difference-in-differences impact estimates for Years 1 through 4. Because we use practice fixed effects, the main effect of intervention status, or the coefficient on the indicator for being in a CPC+ practice (the parameter φ in Table 5.E.3) cannot be estimated by Equation (5.E.1). Therefore, in our report, we use the following approach to show CPC+ and comparison group means in tables reporting difference-in-differences estimates. We show the actual, unadjusted CPC+ means at baseline and each intervention year. For the comparison group, we show the actual, unadjusted mean at baseline and the adjusted mean in each intervention year. We obtained this adjusted mean by subtracting the regression-adjusted difference between the CPC+ and matched comparison groups in each year (obtained from the difference-in-differences model) from the unadjusted CPC+ mean in that same year. We also calculated percentage impacts relative to what the CPC+ mean would have been in an intervention year in the absence of CPC+—that is, the unadjusted CPC+ mean minus the impact estimate.

The general model specification, output, and interpretation of key coefficients for the 30-day readmissions and unplanned acute care outcomes are the same as for the beneficiary-level outcomes, except that the model is specified at the discharge level.

In Equation (5.E.2) (straight-difference model), the coefficient π on the CPC+ practice indicator is the impact estimate that captures whether CPC+ made a difference to a telehealth outcome in 2020 or to a period-specific mortality outcome.

Table 5.E.3. Impact estimates and CPC+ and comparison group means based on a linear regression from Equation (5.E.1): a stylized representation

Year	CPC+ group mean	Comparison group mean	Difference between CPC+ and comparison means	Difference-in-differences impact estimate
Baseline year $(t = 0)$ [reference period]	$\alpha + (\varphi)$	α	(φ)	N/A
First intervention year $(t = 1)$	$\alpha + (\varphi) + \gamma_1 + \theta_1$	$\alpha + \gamma_1$	$(\varphi) + \theta_1$	θ_1
Second intervention year $(t = 2)$	$\alpha + (\varphi) + \gamma_2 + \theta_2$	$\alpha + \gamma_2$	$(\varphi) + \theta_2$	θ_2
Third intervention year $(t = 3)$	$\alpha + (\varphi) + \gamma_3 + \theta_3$	$\alpha + \gamma_3$	$(\varphi) + \theta_3$	θ_3
Fourth intervention year $(t = 4)$	$\alpha + (\varphi) + \gamma_4 + \theta_4$	$\alpha + \gamma_4$	$(\varphi) + \theta_4$	θ_4

Notes: To highlight the key coefficients in Equation (5.E.1), we exclude the coefficients on beneficiary characteristics, practice characteristics, and COVID-19-related controls in the expressions for the CPC+ and comparison group means in this table. The parameter φ in the table denotes the main effect of intervention status, or a coefficient on the indicator for being in a CPC+ practice. This term is not included in Equation (5.E.1); it cannot be directly estimated because the model includes practice fixed effects. We include this term in this table to illustrate the difference-in-differences approach, but we show it in parentheses since we do not obtain an estimate of it. This parameter is differenced out in obtaining the impact estimate.

5.E.5. Model estimation

A. Separate regressions by track and by Medicare Shared Savings Program (SSP) status

For each Medicare claims-based outcome of interest, we estimated six separate regressions for our main analysis. We estimated impacts separately for Track 1 and Track 2, given that participating practices face track-specific requirements, payments, and incentives, which may yield very different impacts. Within each track, in addition to an overall estimate of CPC+, we also estimated impacts separately by SSP participation status at the start of CPC+ (January 1, 2017).[92,93] For selected outcomes, we also estimated impacts separately for other key subgroups,

[92] Practices may change their SSP status over the course of CPC+, but we do not control for this change, because participation in CPC+ may cause a practice to participate in (or drop out of) SSP.

[93] An alternative to estimating separate models by SSP participation status is to use a triple differences estimation approach, where the coefficient on the triple interaction term for SSP participation, participation in CPC+, and the intervention period dummy would provide the impact estimate for SSP practices. Ideally, we would also allow the effect of beneficiary demographics and other practice characteristics (fixed effects) to vary by SSP participation status. However, allowing for the effect of each of the model covariates to vary by SSP participation status would make a triple differences estimation extremely unwieldy. Therefore, we estimated impacts using separate regressions for SSP practices and non-SSP practices within each track.

by including additional interaction terms in the regression, as we describe below in Section 5.E.9.

B. Linear regression

For Medicare expenditures, and for any other continuous outcomes (which include service use outcomes and measures of fragmentation), we estimated Equations (5.E.1) and (5.E.2) as a linear regression. We also used linear regressions for all binary outcomes (which include unplanned readmissions and unplanned acute care, any hospice use, mortality, receipt of recommended services for beneficiaries with diabetes and for breast cancer screening, and appropriate use of medications). An alternative approach would have been to use generalized linear models to account for the distinctive distributional features of service use outcomes and use logistic regression for binary outcomes. However, from the perspective of computational feasibility, nonlinear models were expected to be much more resource- and time-intensive given the large sample sizes. Also, we were more likely to experience problems with model convergence with a nonlinear model, especially when using a specification with practice fixed effects, due to features in the data (for example, a binary outcome being equal to zero or one for all beneficiaries in a practice or for all beneficiaries with a certain combination of characteristics). Therefore, our preferred approach was to estimate linear regressions for all outcomes. We tested how much the choice of functional form might influence the results of our impact evaluation, and we found we obtained nearly identical point estimates of the difference-in-differences impacts using either linear or nonlinear models.[94]

C. Non-independence

All regressions accounted for non-independence across observations within the same practice using standard error estimates clustered at the practice level. Although this approach yields consistent standard error estimates, we considered alternatives for two reasons. First, because there is much stronger correlation across repeated observations from the same beneficiary than among beneficiaries receiving care from the same practice, we tested whether explicitly accounting for beneficiary-level clustering would improve standard error estimates. Second, we tested whether including fixed or random effects at the beneficiary or practice level could help guard against omitted-variable bias by controlling for any time-stable unmeasured beneficiary- or practice-level confounders. The detailed testing methods and results are in Appendix 3.O of the evaluation design report (Peikes et al. 2020b). We found that a model with practice-level fixed effects and standard error estimates clustered at the practice level provided the best performance in terms of the mean squared error of the difference-in-differences point estimate

[94] In a sensitivity analysis comparing inference from two models that were identical except that one was a linear regression and the other was a zero-inflated negative binomial model, we found that across the four years of CPC Classic, the two approaches gave nearly identical point estimates of the difference-in-differences impact for a count variable of number of hospitalizations. The linear model's standard errors around those point estimates were about 10 percent larger than those from the zero-inflated negative binomial model. Therefore, using a linear model should provide us with point estimates similar to those from a more complex, maximum likelihood model, but slightly more conservative standard errors, potentially lowering the likelihood that a small to moderate-size effect is considered statistically significant.

and the coverage of the confidence interval around this estimate.[95] Therefore, we adopted this approach to account for non-independence.

D. Interpretation

We calculated all impact estimates at the beneficiary-year level (or the discharge-year level for readmissions and unplanned acute care outcomes), but we sometimes describe them as differential changes experienced by CPC+ versus comparison practices in our discussion of results, because CPC+ is a practice-level model.

We used regression output to calculate p-values for statistical inference. We used two-tailed tests with $p < 0.10$ as the threshold of statistical significance. Although we did not apply any formal multiple comparison corrections (many of which are known to be overly conservative), our approach to interpreting impact estimates aimed to avoid "false positives" (Peterson et al. 2018). To minimize the probability of mistaking noise for signal when examining impacts, we combined evidence from p-values with evidence from subgroup analyses, related outcomes, sensitivity tests, and the implementation analysis to reinforce or discount the interpretation of observed results.

5.E.6. Control variables

A. Control variables for most outcomes

The regressions for most outcomes (other than discharge-level outcomes, telehealth, and mortality) controlled for beneficiary characteristics, COVID-19-related controls, and practice fixed effects. The beneficiary-level control variables included demographics (age categories, race categories, and gender), original reason for Medicare entitlement, dual eligibility status, and HCC score (Table 5.E.4). For comprehensive risk adjustment, the regression additionally includes indicators for specific chronic conditions that are prevalent in the CPC+ sample, defined by applying the HCC or Chronic Conditions Warehouse (CCW) algorithm on Medicare claims (see Appendix 5.B for more information on how we selected the HCCs to include as controls in most regressions; also see Appendix 5.H for additional HCCs used as control variables in the regressions for the long-term opioid use and potential opioid overuse outcomes). We also include an indicator that the HCC score was calculated using only demographic information as a control variable.[96] We included interactions of HCC score and chronic conditions with indicators for the second and each subsequent intervention year to account for possible changes in the relationship

[95] Although practice fixed effects account for part of the within-practice correlation in outcomes, they do not account for such correlation completely. Specifically, practice fixed effects assume a fixed degree of correlation between any two observations from the same practice. In reality, however, there could be differences in the degree of correlation arising due to different beneficiaries being in the same practice versus correlation in outcomes over time for the same beneficiary in that practice (autocorrelation). Also, practice fixed effects do not account for heteroscedasticity. Therefore, using standard error estimates clustered at the practice level on top of practice fixed effects is likely to provide a more accurate estimate of the standard error for the impact estimates.

[96] HCC scores are calculated on the basis of demographic characteristics only when claims data are not observed for a beneficiary and may not reflect the beneficiary's actual risk. This generally happens when the beneficiary is new to Medicare FFS.

between HCC scores and chronic conditions (measured at the start of CPC+) and outcomes (measured after the first intervention year). For observations in the baseline period, beneficiary-level control variables were measured directly before the start of the yearlong baseline period (based on data from calendar year 2015). For observations in the intervention period, beneficiary-level control variables were measured directly before the start of CPC+ (based on data from calendar year 2016). We did not update the beneficiary characteristics over the intervention period because CPC+ could affect the observed beneficiary characteristics.

Given that we used a difference-in-differences approach, we did not include as control variables Medicare service use or expenditures during the baseline period, as is often done in a cross-sectional analysis. These baseline outcomes are the dependent variable for the baseline observations in our model and, therefore, cannot be viewed as independent of the error term.

COVID-19-related controls were included to mitigate potential bias due to regional differences in the timing, severity, and effects of COVID-19, and behavioral responses to COVID-19 during the fourth intervention year. COVID-19-related controls include excess deaths in the state-HRR, Pandemic Vulnerability Index in the county, Government Response Index in the state, and Social Vulnerability Index in the census tract of each practice (Table 5.E.4). We interacted each COVID-19-related variable with a year indicator for 2020. (See Appendix 5.G for more information on how the COVID-19-related control variables were created.)

For the long-term opioid use and potential opioid overuse outcomes, we additionally controlled for changes in state opioid policies, in order to account for potential confounding due to differential changes in state-level opioid policies and practices over time between CPC+ and comparison groups. (See Appendix 5.H for more information on the state-level opioid policy variables used as covariates.)

The practice fixed effects are indicators or dummy variables—one for each practice in the CPC+ and comparison groups. Including these effects controls for any inherent, time-invariant differences between the CPC+ and comparison practices—whether such differences are observed or unobserved. Including practice fixed effects ensured that we accounted for any remaining imbalance in the practice-level variables used in matching, and in any other unmeasured practice characteristics at baseline, when obtaining the difference-in-differences impact estimates. We did not incorporate changes over time in observed practice characteristics as control variables, because CPC+ could affect practice characteristics.

B. Control variables for discharge-level outcomes

As we noted previously, our analyses for readmissions and unplanned acute care outcomes are at the discharge-year (rather than beneficiary-year) level. Therefore, the difference-in-differences regressions for these outcomes included some additional control variables. Specifically, we included indicators for conditions identified in inpatient or ED episodes of care during the 12 months before the index admission or the index ED visit or observation stay as well as those present at the index event (there are 31 such condition categories for this analysis). Given their similarity to HCCs, to avoid collinearity, we excluded the chronic condition controls for specific HCCs from the readmission and unplanned acute care regressions, while retaining the controls for HCC score. We also controlled for whether the principal diagnosis or procedure associated

with the index discharge is best classified as (1) medicine, (2) surgery/gynecology, (3) cardiorespiratory, (4) cardiovascular, or (5) neurology.[97]

C. Control variables for telehealth and mortality outcomes

As we noted previously, our analyses for telehealth and mortality outcomes will be a straight-difference model instead of the difference-in-differences model. We still adjust for the beneficiary-level control variables in each regression and COVID-19-related controls (for regressions that include observations in PY 4) as in the difference-in-differences models. However, we do not include any beneficiary characteristics interacted with the year indicators, which cannot be estimated because there is only one year included in each model. Also, the regressions for telehealth and mortality outcomes control for baseline practice-level control variables (Table 5.E.4) instead of practice fixed effects. For the telehealth outcomes, to adjust for differences in health care utilization among beneficiaries attributed to the CPC+ and comparison practices at baseline, we additionally include the average monthly Medicare expenditures, annualized number of acute hospitalizations, outpatient ED visits, and ambulatory primary care visits, and an indicator for whether baseline Medicare expenditures and services utilization were missing.

Table 5.E.4. Control variables used in the impact analyses

Characteristic	Variables
Beneficiary-level control variables[a]	
Demographics	Age categories < 65 65–74 (reference category) 75–84 ≥ 85 Race categories White (reference category) Black All other/unknown Gender (binary indicator for male)
Original reason for Medicare eligibility	Original Medicare eligibility categories Age (reference category) Disability only ESRD only or ESRD with disability
Dual eligibility	Indicator for dual status (where dual is defined as those with full or partial Medicaid benefits according to Master Beneficiary Summary File)

[97] The 31 condition categories for the Medicare analysis include a range of diagnoses or risk factors, such as severe infection, metastatic cancer/acute leukemia, diabetes mellitus, end-stage liver disease, drug and alcohol disorders, congestive heart failure, chronic obstructive pulmonary disease, ulcers, cardiorespiratory failure or cardiorespiratory shock, acute renal failure, transplants, hip fracture/dislocation, and more. Our approach was based on reviewing standard models in the literature for risk-adjusting the likelihood of readmission, although it differed from other models in that we did not estimate a separate readmission or unplanned acute care equation for each of the specialty cohorts (medicine, surgery, cardiorespiratory or cardiovascular, or neurology), given our goal of estimating the impact of CPC+ on the risk of all unplanned readmissions or acute care use. The lookback period for these conditions is one to three years, depending on the condition, as specified in the Yale algorithm (YNHHSC/CORE 2019).

Table 5.E.4 *(continued)*

Characteristic	Variables
Chronic conditions	**HCCs**[b] HCC 8 – Metastatic Cancer and Acute Leukemia HCC 18 – Diabetes with Chronic Complications HCC 21 – Protein-Calorie Malnutrition HCC 22 – Morbid Obesity HCC 23 – Other Significant Endocrine and Metabolic Disorders HCC 85 – Congestive Heart Failure HCC 96 – Specified Heart Arrhythmias HCC 106 – Atherosclerosis of the Extremities with Ulceration or Gangrene HCC 111 – Chronic Obstructive Pulmonary Disease HCC 173 – Traumatic Amputations and Complications HCC 186 – Major Organ Transplant or Replacement Status HCC 40 or 47 – Rheumatoid Arthritis and Inflammatory Connective Tissue Disease or Disorders of Immunity HCC 46 or 48 – Severe Hematological Disorders, or Coagulation Defects and Other Specified Hematological Disorders HCC 54 or 55 – Drug/Alcohol Psychosis or Dependence HCC 57 or 58 – Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders HCC 70 or 71 – Quadriplegia or Paraplegia HCC 80 or 82 – Coma, Brain Compression/Anoxic Damage or Respirator Dependence/Tracheostomy Status HCC 86, 87, or 88 – Acute Myocardial Infarction, Unstable Angina and Other Acute Ischemic Heart Disease, or Angina Pectoris HCC 99 or 100 – Cerebral Hemorrhage, or Ischemic or Unspecified Stroke HCC 107 or 108 – Vascular Disease, with Complications HCC 157 or 158 – Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone; or of Skin with Full Thickness Skin Loss **Chronic Conditions Warehouse (CCW) indicator** Alzheimer's disease or dementia HCCs and CCW indicator interacted with follow-up year from second follow-up year onward
Risk score	**HCC score** Indicator for whether HCC score was assigned a new enrollee HCC score, i.e., HCC score was calculated on the basis of demographic characteristics only HCC score interacted with follow-up year from second follow-up year onward Indicator for being assigned a new enrollee HCC score interacted with follow-up year from second follow-up year onward
COVID-19-related controls[c]	
Excess deaths	Monthly excess deaths in the state-HRR averaged during each wave[d] of the pandemic, interacted with a year indicator for 2020 Maximum monthly excess deaths in the state-HRR in 2020 interacted with a year indicator for 2020 Indicator for the wave[d] that the maximum value occurred (reference: wave 1) interacted with a year indicator for 2020
Pandemic Vulnerability Index[e]	Monthly Pandemic Vulnerability Index for each county averaged during each wave[d] of the pandemic interacted with a year indicator for 2020
Government Response Index[f]	Government Response Index in the state averaged across 2020 interacted with a year indicator for 2020
Social Vulnerability Index[g]	Social Vulnerability Index in the census tract in 2018 interacted with a year indicator for 2020[h]

Table 5.E.4 *(continued)*

Characteristic	Variables
Practice-level control variables[i]	
Practice characteristics	Number of primary care practitioners: 1–2 primary care practitioners (reference category) 3–5 primary care practitioners 6+ primary care practitioners Indicator for whether practice is multispecialty[j] Indicator for hospital ownership or health system management or ownership **Indicator for any nursing practitioner or physician assistant in the practice** Meaningful EHR use[k] Never attested Attested since 2011 or 2012 (reference category) Attested since 2013 or later Indicator for participation in prior primary care transformation activities[l] Indicator for participation in SSP ACO as of January 1, 2017 SSP track Medicare Advantage penetration in the practice's county Median household income in the practice's county Percentage of persons in poverty in the practice's county Percentage with college degree in the practice's county Indicator for health professionals (primary care) shortage area in the practice's county **Hospital beds per 10,000 population in the practice's county** Quartile 1 (reference category) **Quartile 2** **Quartile 3** **Quartile 4** Urbanicity of practice's county Rural Suburban Urban (reference category) HRR price index **Census statistical region** Northeast Midwest (reference category) South West

[a] Beneficiary-level control variables were measured either directly before the start of CPC+ (for the intervention-period observations) or directly before the start of the yearlong baseline period (for the baseline-period observations). The yearlong baseline period is 2016 for the practices that started CPC+ in 2017.

[b] We selected a small subset—21 of the 87 HCCs created by the HCC model—for inclusion as control variables. Of the 87 total HCCs, 79 came from the version 22 2017 HCC model and 8 came from the version 21 2017 ESRD model. We selected the 21 HCCs in the subset based on the relative weight of specific HCCs in the HCC score calculation, as well as their prevalence in our analysis sample. We also included an indicator for Alzheimer's disease or dementia from the Chronic Conditions Warehouse (to ensure consistency with CMS's approach for identifying high-risk, Tier 5 beneficiaries in Track 2 of CPC+).

[c] See Appendix 5.G for more information on how the COVID-19-related control variables are created.

[d] We define three waves of the COVID-19 pandemic in 2020 based on trends in excess deaths: March-May (wave 1), June-September (wave 2), and October-December (wave 3).

[e] Data source: National Institute of Environmental Health Sciences, North Carolina State University and Texas A&M University.

[f] Data source: The Oxford Covid-19 Government Response Tracker.

[g] Data source: Centers for Disease Control and Prevention.

[h] We used the 2018 Social Vulnerability Index, the latest year for which the index is available, rather than the 2016 (baseline) version of the index to capture social vulnerability as close to the pandemic period as possible.

[i] Practice-level control variables were only included in regressions for the telehealth and mortality outcomes.

Table 5.E.4 *(continued)*

[j] Defined as having at least one practitioner, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[k] Defined as having at least one practitioner within the practice who attested to meaningful use under the CMS Medicare EHR Incentive Program.

[l] We define prior transformation experience as CPC Classic or MAPCP participation, or whether the practice is recognized as a medical home by NCQA, TJC, AAAHC, URAC, or a state medical-home recognition program.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = Accountable Care Organization; CMS = Centers for Medicare & Medicaid Services; EHR = electronic health record; ESRD = end-stage renal disease; HCC = hierarchical condition category; HRR = hospital referral region; MAPCP = Multi-payer Advanced Primary Care Practice Demonstration; NCQA = National Committee for Quality Assurance; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

5.E.7. Weighting

We applied weights to the observations in the regressions to ensure that (1) beneficiaries who were observed for longer periods receive relatively more weight than those observed for shorter periods (using a Medicare enrollment weight), and (2) the CPC+ and comparison groups are comparable (using a matching weight). To achieve the first goal, for each beneficiary in each year, we calculated fractional enrollment weights that capture the share of months observed during that year. For the impact analysis, a beneficiary is observed during each month that he or she is alive and enrolled in Medicare FFS (enrolled in both Part A and Part B, and not in an MA plan), and has Medicare as the primary payer.

As we describe in Appendix 6.C of the appendices to the supplemental volume of the CPC+ evaluation second annual report (Ghosh et al. 2020), we used an external comparison group as the main comparison group for the impact analysis of Medicare claims-based outcomes. For all analyses using this comparison group, the matching weight was the same as the covariate-balancing propensity score-based weights used to balance the CPC+ and comparison practices on their baseline characteristics.

The final composite weight for beneficiaries in the comparison group was the product of (1) the enrollment weight, and (2) the matching weight. For beneficiaries in the CPC+ group, we needed only the enrollment weight because, by construction, the matching weight for each CPC+ beneficiary is one.

Regressions for most outcomes incorporated these final composite weights—that is, the product of the enrollment weight and the matching weight—for CPC+ and comparison beneficiaries in each baseline and intervention period interval. We used slightly different weights for regressions for the following outcomes:

- For discharge-level measures, such as readmissions and unplanned acute care, we incorporated only the matching weight; the enrollment weight was unnecessary, because these regressions included beneficiaries only if they were enrolled in Medicare FFS during the full month following the discharge.[98] Similarly, for the diabetes process-of-care quality measures, we restricted the analysis to beneficiaries with diabetes who were enrolled in Medicare FFS the whole year so that the enrollment weight, by default, was equal to one. In

[98] The only exception is that the regression retains beneficiaries who die during the month following the discharge.

addition, for outcomes related to appropriate use of medications, we restricted the analysis to Medicare FFS beneficiaries with a relevant diagnosis who were also enrolled in Medicare Part D the whole year so that the enrollment weight, by default, was equal to one.

- For certain binary outcomes defined at the beneficiary level—for example, whether a beneficiary received hospice services—we used the composite weight; before doing so, we recoded the enrollment weight to account for truncation due to beneficiaries potentially dying during the follow-up period. Specifically, the enrollment weight was recoded to a value of one if the outcome was observed, to prevent those who received these services from receiving smaller weights due to death, and was equal to the enrollment weight (using the usual methods to take into account length of time observed) if the outcome was not observed.
- For mortality outcomes, such as 12-month mortality in PY 1 and 48-month mortality in PY 4, we used only the matching weights; the enrollment weight was unnecessary because the outcome was observed over a fixed duration of follow-up for all beneficiaries and we know for certain whether a beneficiary was or was not alive at the end of that follow-up period.

5.E.8. Power to detect effects

Given our large sample sizes, the impact analysis is well-powered to detect even small impacts on the primary outcome—Medicare expenditures without CMS's enhanced payments. For both tracks, the power to detect a non-zero effect if the true impact is equal to the average care management fees (CMFs)[99] ($15 per beneficiary per month [PBPM] in Track 1 and $28 PBPM in Track 2) is more than 99 percent over the first four program years, and more than 95 percent for each program year. Also, the smallest true effects that the study can detect with at least 80 percent power are $8 and $9 PBPM (less than 1 percent) over the first four program years and lower than $12 and $13 PBPM (slightly higher than 1 percent) for each program year in Track 1 and Track 2, respectively. Power remains relatively high when we analyze the SSP and non-SSP subgroups separately— for each of the two subgroups, the power to detect non-zero impacts is at least 93 percent in Track 1 and 99 percent in Track 2 over the first four program years, and at least 75 percent in Track 1 and 96 percent for Track 2 for each program year, assuming true impacts equal to the size of the CMFs.

5.E.9. Variation in effects among subgroups of beneficiaries and practices

As we discuss above, within each track, we estimated impacts separately by baseline SSP status of practices to investigate whether participating in both CPC+ and an SSP ACO had a different impact than participating in CPC+ alone. Given that SSP participation is a critical dimension on which participating CPC+ practices differ, we estimated these separate regressions, by SSP status, for all outcomes.

[99] Our calculations are conservative in that they assess the power to detect an effect of the size of the CMF; we would have even better power to detect an effect of the size of all of CMS's enhanced payments combined (including the CPC+ CMFs, the comprehensiveness supplement [for Track 2 practices only], Performance-based Incentive Payments, and the payments made to practices' Accountable Care Organizations [ACOs] for SSP shared savings).

In addition, the impacts of CPC+ could differ for different types of beneficiaries and practices, based on other baseline characteristics. Knowing whether CPC+ is more or less effective for certain types of practices or beneficiaries could inform strategies to help practices succeed. Those findings could also provide insights about the types of practices and beneficiaries who should be encouraged to participate in future primary care transformation efforts like CPC+. Therefore, for selected outcomes, we estimated the effects of the program on *subsets of beneficiaries* for whom CPC+ is likely to have especially large effects, such as the chronically ill and other patients with complex health conditions (Brown et al. 2012; Rich et al. 2012). We also examined effects for different *types of practices,* such as those that had a larger number of primary care practitioners, had participated in prior primary care transformation initiatives at baseline, or were owned by a hospital or health system. For these subgroup analyses, we included in the regressions interactions of variables denoting subgroup membership with the indicator for CPC+ versus comparison status,[100] the intervention year indicator, and the CPC+ indicator interacted with the intervention year indicator. Because there is likely to be significant correlation among practice characteristics, for example, between practice size and ownership, testing for differential effects for each practice characteristic separately may not unmask the real drivers of significant differences. Therefore, for the practice subgroup analysis, we included interactions with subgroup indicators for all practice characteristics in a single regression to disentangle which characteristics actually influence program impacts.[101] Our main subgroup analyses focus on estimating differential effects for Medicare expenditures without enhanced payments. If we find evidence of differential effects for any particular subgroup(s), we explore it further with additional analyses (for example, by examining effects on service use outcomes for that subgroup, or estimating subgroup effects separately within the SSP and non-SSP samples).

A. Practice-level subgroups

We estimated differential effects for subgroups defined at baseline by various characteristics, as shown in Table 5.E.5.

Table 5.E.5. Practice-level subgroups

Subgroup definitions	Why potentially important to CPC+
Whether the practice had participated in prior primary care transformation initiatives—defined as participation in CPC Classic or the Multi-Payer Advanced Primary Care Practice demonstration, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status	Practices with participation in prior primary care transformation initiatives may be more advanced and, as a result, may require less time and resources to make changes at the start of CPC+. On the other hand, these practices may have less room for improvement after their prior practice transformation experience.

[100] The interaction between the practice subgroup membership indicator and the CPC+ indicator cannot be directly estimated in the practice-level subgroup analysis because the model includes practice fixed effects.

[101] Given the high degree of overlap between certain beneficiary subgroups—for example, between those above the 75th percentile of the HCC score distribution and those above the 90th percentile—we did not include interactions with all beneficiary subgroup definitions in a single regression. Instead, we estimated a separate regression for each subgroup of interest where we included interactions of treatment (identifying CPC+ practices) and post-intervention (identifying time periods after CPC+ began) indicators with the subgroup indicator denoting whether the beneficiary had that characteristic.

Table 5.E.5 *(continued)*

Subgroup definitions	Why potentially important to CPC+
Practice size, as defined by the number of primary care practitioners (1–2, 3–5, 6 or more)	Larger practices will likely have access to greater resources and better medical infrastructure. Smaller practices may, on the other hand, have greater flexibility to implement changes more rapidly.
Whether the practice was multi-specialty versus primary care only	Multi-specialty practices face different financial incentives and economies of scale.
Practice ownership by a hospital or a health system[a]	Practices owned by a hospital or health system will likely have access to greater resources and better medical infrastructure. These practices may also face different financial incentives and economies of scale.
Whether the practice was in a rural, suburban, or urban area	Practices in more urban areas will likely have access to greater resources and better medical infrastructure than those in rural areas.

[a] We constructed the variable for hospital or health system ownership at baseline using IQVIA data. We checked this variable against what all responding practices reported in the 2017 practice survey and found good concordance. More than 86 percent of practices that were not hospital- or system-owned according to the IQVIA data reported that they were independent, physician-owned, and less than 7 percent of those classified as owned by a system or hospital in IQVIA data reported that they were independent, physician-owned in the survey.

AAAHC = Accreditation Association for Ambulatory Health Care; NCQA = National Committee for Quality Assurance; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

B. Beneficiary-level subgroups

When analyzing differential impacts by subsets of beneficiaries, we considered subgroups that tend to have higher utilization and cost, for example, beneficiaries with higher HCC scores or those with behavioral health conditions (Table 5.E.6). As with the beneficiary-level control variables, we identified beneficiary subgroups directly before the start of the baseline period for baseline observations and directly before the start of the intervention period for intervention period observations.

Table 5.E.6. Beneficiary subgroups

Subgroup definitions	Why potentially important to CPC+
Beneficiaries in the highest quartile of the distribution of HCC score (both Track 1 and Track 2), or patients who either were in the highest decile of the distribution of HCC score or had dementia (both Track 1 and Track 2)[a]	Beneficiaries with high HCC scores and/or those with dementia are at greater risk of incurring high health care expenditures. Also, these high-risk definitions are based on CMS's criteria for identifying beneficiaries in risk Tier 4 and risk Tier 5.[b]
Beneficiaries with behavioral health conditions (HCCs for schizophrenia or major depressive, bipolar, and paranoid disorders, or drug/alcohol psychosis or drug/alcohol dependence)[a]	Behavioral health conditions are among the costliest health conditions and key drivers of health care utilization.[c]
Beneficiaries with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions,[d] who also had at least one hospitalization in the year before the start of CPC+ (for observations in the intervention period) or the year before baseline (for observations in the baseline period)[a]	Beneficiaries with multiple chronic conditions who have also experienced relatively recent hospitalizations are among the highest-risk beneficiaries.
Beneficiaries who were also eligible for Medicaid (dually eligible)	Dually eligible beneficiaries typically have higher health care utilization and higher costs than those who are not dually eligible.

Table 5.E.6 *(continued)*

[a] As with the beneficiary characteristics, the HCC score or conditions used to define these subgroups are measured directly before the start of CPC+ (for the intervention-period observations) or directly before the start of the yearlong baseline period (for the baseline-period observations). We exclude new enrollees from these subgroup analyses since their HCC scores and HCCs are based on demographic characteristics only and we cannot reliably assess their actual risk status in the absence of claims data.

[b] CMS's approach for identifying Tier 4 and Tier 5 high-risk beneficiaries differs from the approach we used in the impact analysis. Specifically, CMS includes the entire Medicare population in each CPC+ region, and uses the region-specific distribution of HCC scores to identify the 75th and 90th percentiles of the distribution. For the impact analysis, we identified the high-risk HCC cutoffs by looking at the distribution of 2016 HCC scores among Medicare beneficiaries in our baseline sample, and across all regions. Also, CMS identifies Tier 5 patients for Track 2 only, whereas we also ran subgroup analyses for Tier 5 beneficiaries in Track 1 practices. Details of our methodology for calculating HCC scores and how it deviated from CMS's approach are in Appendix 5.B, Section 5.E.3.

[c] Roehrig, Charles. "Mental Disorders Top the List of the Most Costly Conditions in the United States: $201 Billion." *Health Affairs,* vol. 35, no. 6, 2016, pp. 1130–1135.

[d] The 12 frequently occurring chronic conditions we used in this definition are: congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, ischemic heart disease, diabetes, metastatic cancer and acute leukemia, stroke, depression, dementia, atrial fibrillation, rheumatoid arthritis or osteoarthritis, and chronic kidney disease. These chronic conditions are measured by HCCs (or combinations of HCCs) except for dementia, which is measured using the indicator for Alzheimer's disease or dementia from the Chronic Conditions Warehouse, and chronic kidney disease, which is measured using the original reason for entitlement to Medicare being ESRD.

CMS = Centers for Medicare & Medicaid Services; ESRD= end-stage renal disease; HCC = hierarchical condition category.

For all subgroup analyses, we checked the percentage of the CPC+ and comparison groups that belonged to each subgroup category to ensure similarity in the percentages across the two groups. We also examined key baseline characteristics we used in matching, such as Medicare expenditures, acute care hospitalizations, and outpatient ED visits to check the similarity of the CPC+ and comparison groups within each subgroup. For most characteristics, CPC+ and comparison groups were well-balanced within each subgroup.[102, 103] This was also true for key baseline characteristics within subpopulations used in examining specific outcomes, such as beneficiaries ages 18 through 75 (the subpopulation used for the diabetes measure), female beneficiaries ages 52 through 74 (the subpopulation used for the breast cancer screening measure), beneficiaries with a minimum number of ambulatory care visits (the subpopulation used for the continuity-of-care measures), and beneficiaries who are continuously enrolled in Medicare Part D and have a relevant diagnosis (the subpopulation used for outcomes related to appropriate use of medications).

[102] We considered CPC+ and comparison groups to be well-balanced on a characteristic if the standardized difference was 0.25 standard deviations or less. We found that, for most characteristics, the standardized difference was well under the 0.25 threshold within each subgroup.

[103] The only subgroups where the standardized differences were higher than 0.25 for more than 10 percent of the variables (out of 61 variables examined in total) were the subgroups based on practice location in rural or suburban counties. For these subgroups, the higher standardized differences were mostly found among lower-priority variables (such as region indicators, county-level poverty rates, the number of hospital beds, or the median household income in the county). Even for these rural and suburban county subgroups, the standardized differences were much lower than 0.1 for high-priority variables (such as the baseline outcomes we used in matching).

C. Checking for differences in impact estimates by subgroup

The following steps describe the process we used to check for differences in impact estimates by practice subgroup:

1. To test for significant differences across all subgroups defined by practice characteristics, we conducted a joint test of significance across all subgroups to determine whether there was any evidence of variation in impacts across practice subgroups in general. This approach helped minimize the number of tests checking for statistically significant differences across subgroups and reduced the likelihood of erroneously concluding that a chance difference across subgroups was meaningful. If we were unable to reject the null hypothesis in this test of no difference across the range of subgroups defined by all practice characteristics, we considered any evidence of differences across subgroups defined by a *single* characteristic to be weak.
2. For subgroups defined by any particular practice characteristic, we tested whether the impact estimates for the subgroups defined by the same characteristic were significantly different from one another:[104]
    a. If this test did not show a statistically significant difference, we concluded that there was no meaningful difference in impact estimates for subgroups defined by that particular practice characteristic.
    b. Only if this test showed a statistically significant difference ($p < 0.10$) did we test for whether the impact estimate *within* the subgroup was significantly different from zero.

For example, for the subgroup defined by prior experience with primary care transformation, we first tested whether the impact estimates for practices that participated in prior transformation activities and those that did not were significantly different from one another. If the p-value from this test did not lead us to reject the hypothesis that the impacts were similar, we concluded that impacts did not vary meaningfully across subgroups defined by prior experience with primary care transformation. On the other hand, if this test showed a statistically significant difference ($p < 0.10$), we then tested whether the impact estimate within each subgroup—practices that participated in prior transformation activities and those that did not—was significantly different from zero.

As noted above, for subgroups defined by beneficiary characteristics, we estimated a separate regression for each subgroup of interest. Consequently, we did only Step 2 of the above process for beneficiary subgroup analyses.

[104] We conducted the test for statistically significant differences across subgroups defined by a single characteristic, even if the null hypothesis in the joint significance test was not rejected—that is, even if the evidence for variation in impact estimates across subgroups was weak from the joint test of significance across all subgroups. If the joint test across all subgroups was not statistically significant, we would more cautiously interpret any statistically significant difference between subgroups defined by a single characteristic.

5.E.10. Sensitivity tests

We calculated alternative estimates as robustness checks of the main impact estimates on Medicare expenditures. Specifically, we assessed the sensitivity of our results to changes in the following key elements of our estimation approach: (1) definition of the beneficiary sample, (2) modeling assumptions, (3) length of the baseline period, (4) controlling for contemporaneous (same year) SSP participation status, and (5) alternative definition of the counterfactual (by using a triple differences approach). We also conducted COVID-19-specific sensitivity tests by examining impact estimates after excluding claims from the peak COVID-19 period (March–May 2020). We also conducted a sensitivity test for readmissions and unplanned acute care outcomes by defining the outcome at the beneficiary level instead of at the discharge level. We describe the motivation for each sensitivity test in Table 5.E.7.

When results from the sensitivity tests were inconsistent with results from our main analysis, we incorporated that information into our discussion and interpretation of findings. We assessed the conditions under which the alternative estimates would be preferred, and the likelihood that those conditions were met.

Table 5.E.7. Sensitivity tests

Sensitivity test	Motivation
Altering the composition of the beneficiary sample	
Use sample of beneficiaries attributed during the intervention period (who are also attributed during the baseline period) as the baseline sample.	Helps to adjust for changes in sample composition between baseline and follow-up that may differ for the intervention and comparison groups.
Examine impacts for the subset of Medicare beneficiaries attributed in the first quarter of the period (that is, the first quarter of the baseline period and the first quarter of the intervention period).	Removes effects that may be due to differences over time in sample additions between the intervention and comparison groups. This might occur if, for example: (1) different types of beneficiaries are attracted to receive care at CPC+ practices than at comparison practices, (2) CPC+ and comparison practitioners have incentives to retain or dismiss certain types of patients, or (3) a higher proportion of beneficiaries are attributed to the CPC+ than comparison practices over time via Annual Wellness Visits.
Instead of following an intent-to-treat (ITT) approach to defining the beneficiary sample (once attributed, beneficiaries stay in the sample for the rest of the baseline or intervention period), allow beneficiaries to drop out of the sample, if they no longer meet attribution requirements.	Assesses whether the ITT approach tends to attenuate true effects by retaining beneficiaries in the intervention group who are no longer seen by CPC+ practices.
Altering the modeling assumptions	
For analysis of expenditures, use a generalized linear model with log link.	Accounts for skewed expenditure distribution.
Log-transform the expenditures variable (generating impact estimates in percentage terms).	Reduces influence of high-cost cases; accounts for skewed expenditure distribution.
Trim expenditures at 98th percentile.	Reduces influence of high-cost cases.
Altering length of baseline period	
Use two instead of one pre-intervention years in the baseline period.	Tests whether impact estimates are sensitive to using a longer baseline period and whether there are differences in trends prior to CPC+ for CPC+ and comparison practices.

Table 5.E.7 *(continued)*

Sensitivity test	Motivation
Controlling for contemporaneous SSP participation	
Use contemporaneous (same year) SSP status instead of baseline SSP status as a covariate or to separately examine impacts for SSP/non-SSP subgroup.	Accounts for any difference in contemporaneous SSP participation between the CPC+ and comparison groups and its effect on outcomes.
Alternative definition of counterfactual	
Use a triple-differences model and include non-participating practices in CPC+ regions and unselected practices in comparison regions in the analytic sample.	Accounts for regional shocks that might affect CPC+ and comparison regions differently (see Appendix 5.F for details).
COVID-19-specific sensitivity tests (for PY 4 estimate)	
Examine impacts after excluding the first three months of COVID-19 (March–May 2020).	Tests for the sensitivity of the estimate to the reduction in service utilization in the peak COVID-19 period.
Definition of outcome measures	
Examine impacts on the beneficiary-level readmission and unplanned acute care outcomes, defined as the probability of readmission or unplanned acute care after an index discharge[a] during a year.	Removes concerns about possible endogeneity in analysis of readmission and unplanned acute care outcomes, which can arise if CPC+ alters the probability of an index discharge. In that case, the analysis of the discharge-level readmission and unplanned acute care measures would be biased, because CPC+ may have prevented hospitalizations or ED visits or observation stays that would have been at lower relative risk of a readmission or receipt of unplanned acute care.
Use expenditures that exclude the QPP payments	Tests whether estimates are sensitive to an alternative definition of the primary outcome measures – Medicare expenditures without enhanced payments.

[a] An index discharge refers to an index hospital discharge (for the outcomes of readmission and unplanned acute care after hospitalization) or an index ED visit or observation stay (for the outcome of unplanned acute care after an ED visit or an observation stay).

ED = emergency department; ITT = intent-to-treat; PY = Program Year; QPP = Quality Payment Program; SSP = Medicare Shared Savings Program.

5.F. Triple-differences analysis

Our main impact estimation approach for the evaluation of CPC+ is based on a difference-in-differences strategy, which uses comparison practices from external (non-CPC+) regions. In this Appendix, we use a triple-differences estimation approach to examine the robustness of the main findings reported in Chapter 5, that is, whether the main estimates could be biased due to inadequately accounting for differences in regional trends. Because the comparison practices are from non-CPC+ regions, they may experience different trends in outcomes (potentially due to different market conditions or regional shocks) than CPC+ practices do, which might cause our impact estimates to reflect these differential regional trends rather than the causal impacts of CPC+ itself.

In the third annual report, we found no evidence that the impacts of CPC+ through Program Year (PY) 2 (2018) were driven by regional trends. We repeat the triple-differences analysis in the fourth annual report for two reasons. First, differences in regional trends could emerge over time. Second, significant variation across regions in the effects of the COVID-19 pandemic could create differential regional trends in PY 4 (2020).

In the main chapter, we compare the main difference-in-differences results, which are based on regressions controlling for region-specific effects of COVID-19, to the triple-differences estimates. The results from these two approaches could differ if either (1) the COVID-19 controls in the difference-in-differences model inadequately control for the different regional impacts of COVID-19 in the CPC+ and comparison regions, or (2) if there are other, non-COVID-19-related, differences in regional trends between CPC+ and comparison regions. Note that when estimating the impacts of CPC+ across four program years, two tracks, and two SSP subgroups, the number of individual impact estimates becomes large enough that statistically significant impact estimates may occur purely by chance, leading to disagreements between the difference-in-differences and triple-differences models' estimates. Therefore, we take a fairly conservative approach and determine that when the difference-in-differences estimates falls within the triple-differences 90 percent confidence interval, the two models are aligned and are not substantially different from each other.

In this Appendix, we first explain the sources of the potential bias in the difference-in-differences estimation strategy (Section 1). We then explain the triple-differences analytic methods we use to assess the possibility of bias in the main model (Section 2). We next describe the results (Section 3), including results by Medicare Shared Savings Program (SSP) status and the sensitivity of the triple-differences results to alternative specifications. Finally, we discuss the implications of our findings in Section 4.

5.F.1. Key takeaways

- The triple-differences analysis showed no statistically significant effects of CPC+ on any of the key outcomes (i.e., Medicare fee-for-service [FFS] expenditures, acute hospitalizations, and outpatient emergency department [ED] visits) during the first four years of CPC+.
- The impact estimates from the triple-differences analysis were generally more conservative, that is, smaller in magnitude and less likely to be statistically significant, than those from the

main difference-in-differences analysis, but for most outcomes and years, the difference-in-differences estimate is contained within the triple-differences' 90 percent confidence interval. In most of the cases where the difference-in-differences estimate is not contained, we think that the difference-in-difference estimates reflect the direct effects of CPC+ as well as differences in trends between the CPC+ and comparison regions, which the triple-differences estimates net out. In these cases, the magnitude of estimates from the main difference-in-differences model should be interpreted with caution.

- While the difference-in-differences analysis found important differing effects between SSP and non-SSP practices, the triple-differences analysis did not find statistically significant impacts within either group.
- The results of the triple-differences analyses are consistent across a variety of alternative regression weights and sample restrictions.
- Taken together, the triple-differences model and the difference-in-differences model both found no effects on Medicare FFS expenditures without enhanced payments. Although we found evidence for reductions of less than 3 percent in acute care from the difference-in-differences model, the triple-differences models suggested smaller effects or no significant effects.

5.F.2. Introduction

A. Potential bias due to regional variation

The difference-in-differences model used in the CPC+ impact analysis assumes that, in the absence of the intervention, outcomes for beneficiaries attributed to CPC+ practices would follow the same trajectory as outcomes for beneficiaries attributed to comparison practices (Wing et al. 2018). However, because our comparison practices are drawn from external regions, it is possible that region-specific shocks or regional trends during the intervention period could violate this assumption by causing the trend in outcomes in one region to differ from those in other regions for reasons that are unrelated to CPC+.

Regional trends might include changes in market characteristics at the level of the zip code, county, or hospital referral region (HRR). These characteristics could include the supply of primary care physicians, openings or closures of major health care facilities, consolidation of hospitals or practices, or adoption of health IT and telehealth services. These trends could also result from changes in policy or advocacy at the state level, such as Colorado's Medicare-Medicaid Financial Alignment Initiative (which ended on December 31, 2017, early in the CPC+ intervention period), the Michigan Primary Care Consortium (which facilitates knowledge-sharing around principles of the patient-centered medical home), or any number of possible changes in reimbursement policy by non-Medicare payers in a CPC+ or comparison region. Lastly, there could be differential shocks from natural disasters and pandemics, as well as differential policy responses to these shocks, at both local and state levels. The differences in overall regional trends could bias the CPC+ impact estimates in either direction, depending on the exact nature of the regional shocks. That is, differences in secular trends by region could make changes in acute hospitalizations or other outcomes of CPC+ beneficiaries lower or higher than changes among comparison group beneficiaries, even if CPC+ had no effect.

While we do not have a specific hypothesis of how general regional trends might affect our impact estimates, we do have some theories of how COVID-19 might affect estimates. COVID-19 hit CPC+ regions somewhat harder than comparison regions during 2020 (PY 4), resulting in approximately 1 percent larger decreases in health care expenditures and utilization in 2020 for CPC+ regions than for comparison regions (see Appendix 5.D). Without controlling for these region-specific pandemic-driven changes, our difference-in-differences model would attribute the larger decrease in health care expenditures in 2020 for CPC+ regions to CPC+ itself, leading the PY 4 impact estimates to be more favorable.

Controlling for the effects of the pandemic by including control variables (as we did for the main impact analysis reported in Chapter 5) will reduce this potential bias if the control variables accurately capture the relevant regional effects of the pandemic. If they do not, there could be some remaining bias.

Despite these potential sources of bias, we chose the differences-in-differences model with COVID-19 controls as our main analytic strategy, and the triple-differences model as a key sensitivity test, for a few reasons: the differences-in-differences model is simpler and yields more precise impact estimates, it allows us to directly compare our findings to those of the survey-based analysis of CPC+ and our analyses of CPC Classic, and the breadth of CPC+ and comparison regions should theoretically mitigate the impact of differential regional trends.

B. Overview of the triple-differences model

We assessed the possibility of bias arising from the use of an external comparison group in our main analysis through a triple-differences model. This model goes beyond the difference-in-differences model to additionally net out the difference in changes in outcomes between non-participating practices in CPC+ regions (non-CPC+ practices) and unselected practices in comparison regions (non-comparison practices) to reduce the potential bias due to regional shocks.

The underlying assumption of the triple-differences model is that, in the absence of the CPC+ intervention, the trend divergence (if any) between the CPC+ and comparison practices during the intervention period would be similar to the trend divergence (if any) between the non-CPC+ practices and non-comparison practices. Because we do not have data to assess the counterfactual for *the intervention period*, that is, what the outcome trends for CPC+ practices would have been without the CPC+ intervention, we used the outcomes during *the baseline period* to test this assumption. We also conducted sensitivity tests to examine the robustness of the triple-differences estimates.

Although the triple-differences model rigorously accounts for the possibility of regional bias in our estimates, in our main impact analysis we used the difference-in-differences model instead of the triple-differences model, for six reasons:

1. Since CPC+ is the successor of the Comprehensive Primary Care initiative (CPC Classic), using a difference-in-differences approach for both CPC+ and CPC Classic facilitates comparing the impact findings between these two initiatives.

2. Compared to the widely used difference-in-differences model, the triple-differences model has a more complex design and its results are less transparent and more difficult to interpret.
3. The triple-differences estimates are less precise than the difference-in-differences estimates, due to the added uncertainty from estimating an additional layer of difference.
4. We used the same external comparison group for our survey analyses as for the claims-based impact analysis, and multiple comparison groups needed for the triple-differences model would be infeasible from a survey budget perspective. Using the same comparison group allows for comparison and synthesis across the survey and claims-based impact results.
5. It is more resource intensive to process data for the larger triple-differences sample for all practices in the CPC+ and comparison regions and to implement the triple-differences analysis across all outcomes and regression models (for example, regressions by track and SSP status, subgroup regressions, and sensitivity analysis) that we include in annual reports.
6. The difference-in-differences approach contains 14 regions in the CPC+ group and 27 regions in the comparison group. Theoretically, this should insulate against small region-level shocks. In practice, we estimated that the cumulative difference between CPC+ and comparison regions in the 2019 to 2020 (PY 3 to PY 4) change in ED visits, hospitalizations, and Medicare expenditures due to the COVID-19 pandemic was only 1 percent of the baseline means (see Appendix 5.D).

For these reasons, the triple-differences analysis serves as a key sensitivity test of the main analysis, as it more rigorously controls for regional differences, but is not suitable as the main analysis.

5.F.3. Methods

A. Study population, unit of observation, and outcomes

Sample of practices. We applied the triple-differences model to practices in regions that include the 2017 CPC+ Starters and practices in the comparison regions. The sample of practices includes CPC+ and comparison practices, as well as non-CPC+ practices and non-comparison practices, which are primary care practices in the same regions as CPC+ and comparison practices that did not participate in CPC+ or were not selected as comparison practices. For non-CPC+ practices and non-comparison practices, we applied the same practice exclusion criteria used in selecting the comparison group described in Chapter 5.

Beneficiary assignment based on attribution

To estimate the triple-differences model, we used an intent-to-treat (ITT) analysis approach that includes practices described above and their "assigned" beneficiaries. Our approach for beneficiary assignment was largely consistent with the one taken in the main impact analysis in Chapter 5. That is, once we attributed a beneficiary to a CPC+ or comparison practice in any baseline or intervention quarter, we continued to assign that beneficiary to the same practice in future baseline and intervention quarters, regardless of whether the beneficiary continued to receive care at that practice. However, if a beneficiary was at first attributed to a non-CPC+ practice or a non-comparison practice during the intervention period, but later attributed to a CPC+ or comparison practice in subsequent program years, that beneficiary would be re-

assigned to that CPC+ or comparison practice in the subsequent program years. We did this to ensure similarity between the difference-in-differences and triple differences CPC+ and comparison samples.

Table 5.F.1 shows the number of practices and the number of Medicare FFS beneficiaries in the triple-differences analysis and in the main impact analysis, for each track and practice group. Compared to the main analysis, the triple-differences sample contains the same number of CPC+ and comparison practices, but a slightly higher number of unique beneficiaries assigned to these practices (less than 1 percent higher) for both Track 1 and Track 2. The slight increase in the number of unique beneficiaries assigned to CPC+ and comparison practices in the triple-differences analysis is due to minor adjustments to the ITT approach compared to that used in the main analysis.[105]

Table 5.F.1. Numbers of practices and of Medicare FFS beneficiaries in the triple-differences analysis and the difference-in-differences analysis, by track and practice group

	CPC+		Comparison		Non-CPC+		Non-comparison	
Research sample	Triple-differences	Difference-in-differences	Triple-differences	Difference-in-differences	Triple-differences	Difference-in-differences	Triple-differences	Difference-in-differences
Track 1								
Number of practices	1,373	1,373	5,243	5,243	8,337	n.a.	20,656	n.a.
Number of beneficiaries	1,458,158	1,446,195	4,945,126	4,935,793	3,844,893	n.a.	10,918,888	n.a.
Track 2								
Number of practices	1,515	1,515	3,783	3,783	7,276	n.a.	20,115	n.a.
Number of beneficiaries	1,775,193	1,762,047	4,184,439	4,173,931	3,234,914	n.a.	10,640,530	n.a.

Source: Mathematica's analysis of Medicare claims data from January 2014 through December 2020.

FFS = fee-for-service; n.a. = not applicable; non-comparison = unselected practices in comparison regions; non-CPC+ = non-participating practices in CPC+ regions.

Unit of observation. The unit of observation in the regressions is the beneficiary-year. Each beneficiary has observations for as many years as the person remains in the sample and can still be observed in Medicare claims. The observability criteria are the same as in the main impact analysis. Specifically, to be observed, a beneficiary assigned to a practice for the baseline or the intervention period had to be alive, have both Part A and B Medicare FFS coverage with

[105] Specifically, for the triple-differences analysis, we allowed (1) 2018 Starter comparison practices in 2017 Starter comparison regions to be non-comparison practices, (2) practices that applied to CPC+ but were not selected to participate to be non-CPC+ practices, and (3) the baseline and intervention periods for the non-CPC+ and non-comparison practices to be the same as those for the 2017 Starters. For example, we expected allowing 2018 Starter comparison practices in 2017 Starter comparison regions to be non-comparison practices to increase the number of beneficiaries assigned to 2017 CPC+ or comparison practices, because beneficiaries attributed to 2018 Starter comparison practices in PY 1 could switch into 2017 Starter CPC+ or comparison practices in later program years.

Medicare as the primary payer, and not be covered under a Medicare Advantage or other Medicare health plan.

Outcomes

We defined a set of main outcomes that represent key hypothesized effects of the model for which all subgroup analyses and sensitivity tests were conducted. We then identified a set of secondary outcomes which were particularly impacted by COVID-19, or that provide additional context to the results for the main outcomes. We did not conduct subgroup analyses or sensitivity tests for the secondary outcomes.

- Main outcomes:
  - Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP, in dollars per beneficiary per month
  - Annualized number of acute hospitalizations per 1,000 beneficiaries
  - Annualized number of outpatient ED visits per 1,000 beneficiaries
- Secondary outcomes:
  - Annualized ambulatory primary care visits per 1,000 beneficiaries
  - Annualized urgent care center visits per 1,000 beneficiaries
  - Annualized non-face-to-face primary care visits as a portion of all ambulatory primary care visits per 1,000 beneficiaries

B. Model specification

Main model

For all outcomes except the proportion of primary care ambulatory visits that were non-face-to-face, we used the following specification: Let *i* index the beneficiary; *j* index the practice; and *t* index time, where *t* ranges from 0 to 4, with 0 denoting the baseline year. We estimated a triple-differences regression model for beneficiaries assigned to CPC+ practices, selected comparison practices, non-CPC+ practices, and non-comparison practices. The model had the following form:

$$y_{ijt} = \alpha + \beta X_{it} + \pi X_{it} s_j + \gamma_t p_t + \theta_t a_j p_t + \delta_t s_j p_t + \mu_t a_j s_j p_t + b_j + \varepsilon_{ijt}, \quad \text{(5.F.1)}$$

where

y_{ijt} is an outcome variable for beneficiary *i*, in practice *j*, in year *t*.

X_{it} is a vector of characteristics of beneficiary *i* measured at the start of the baseline period for baseline observations, and at the start of the intervention period for intervention period observations. For example, beneficiary characteristics include demographics (age, race, and gender), variables capturing Medicare and Medicaid eligibility (that is, original reason for

Medicare eligibility, and dual Medicare-Medicaid status), and hierarchical condition category (HCC) score.

p_t (for "post") is an intervention-period indicator that takes the value of 1 during a specific program year, in this case PY 1 through PY 4, and 0 otherwise.

b_j is a practice-level fixed effect for practice *j*, which controls for all time-invariant practice characteristics.

a_j (for "area") is a binary indicator for being in a CPC+ region; the indicator takes the value of 1 if the practice *j* is located in a CPC+ region and is 0 otherwise. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

s_j (for "selected") is a binary indicator for being a CPC+ or comparison practice; the indicator takes the value of 1 if practice *j* is a CPC+ practice or a comparison practice, and is 0 if practice *j* is a non-CPC+ practice or a non-comparison practice. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

ε_{ijt} is the idiosyncratic error term. It represents unexplained variability in the outcome variable for beneficiary *i*, in practice *j*, during year *t*.

Our coefficients of interest are the $\widehat{\mu_t}$, which represent the triple-differences impact estimate for each of the four program years. Table 5.F.2 summarizes how we used the parameter estimates from Equation (5.F.1) to obtain the regression-adjusted group means for CPC+ practices, comparison practices, non-CPC+ practices, and non-comparison practices, for the baseline and four program years.

Table 5.F.2. Impact estimate and group means for CPC+ practices, comparison practices, non-CPC+ practices, and non-comparison practices based on a linear regression from Equation (5.F.1)

Comparison regions

Year	Comparison group mean	Non-comparison group mean	Difference between comparison and non-comparison group means	Difference-in-differences	Triple-differences
Baseline year $(t=0)$ [reference period]	$\alpha+\pi+(\sigma)$	α	$\pi+(\sigma)$	N/A	N/A
PY 1 $(t=1)$	$\alpha+\pi+\gamma_1+\delta_1+(\sigma)$	$\alpha+\gamma_1$	$\delta_1+\pi+(\sigma)$	δ_1	N/A
PY 2 $(t=2)$	$\alpha+\pi+\gamma_2+\delta_2+(\sigma)$	$\alpha+\gamma_2$	$\delta_2+\pi+(\sigma)$	δ_2	N/A
PY 3 $(t=3)$	$\alpha+\pi+\gamma_3+\delta_3+(\sigma)$	$\alpha+\gamma_3$	$\delta_3+\pi+(\sigma)$	δ_3	N/A
PY 4 $(t=4)$	$\alpha+\pi+\gamma_4+\delta_4+(\sigma)$	$\alpha+\gamma_4$	$\delta_4+\pi+(\sigma)$	δ_4	N/A

CPC+ regions

Year	CPC+ group mean	Non-CPC+ group mean	Difference between CPC+ and non-CPC+ group means	Difference-in-differences	Triple-differences
Baseline year $(t=0)$ [reference period]	$\alpha+\pi+(\rho+\sigma+\tau)$	$\alpha+(\rho)$	$\pi+(\sigma+\tau)$	N/A	N/A
PY 1 $(t=1)$	$\alpha+\pi+\gamma_1+\theta_1+\delta_1+\mu_1+(\rho+\sigma+\tau)$	$\alpha+\gamma_1+\theta_1+(\rho)$	$\pi+\delta_1+\mu_1+(\sigma+\tau)$	$\delta_1+\mu_1$	μ_1
PY 2 $(t=2)$	$\alpha+\pi+\gamma_2+\theta_2+\delta_2+\mu_2+(\rho+\sigma+\tau)$	$\alpha+\gamma_2+\theta_2+(\rho)$	$\pi+\delta_2+\mu_2+(\sigma+\tau)$	$\delta_2+\mu_2$	μ_2
PY 3 $(t=3)$	$\alpha+\pi+\gamma_3+\theta_3+\delta_3+\mu_3+(\rho+\sigma+\tau)$	$\alpha+\gamma_3+\theta_3+(\rho)$	$\pi+\delta_3+\mu_3+(\sigma+\tau)$	$\delta_3+\mu_3$	μ_3
PY 4 $(t=4)$	$\alpha+\pi+\gamma_3+\theta_3+\delta_3+\mu_3+(\rho+\sigma+\tau)$	$\alpha+\gamma_4+\theta_4+(\rho)$	$\pi+\delta_4+\mu_4+(\sigma+\tau)$	$\delta_4+\mu_4$	μ_4

Notes: To highlight the key coefficients in Equation (5.F.1) above, we exclude the coefficients on beneficiary characteristics and practice fixed-effects in the expressions for group means in this table. The parameter ρ denotes a coefficient on the indicator for being in a CPC+ region, the parameter σ denotes a coefficient on the indicator for being a CPC+ or comparison practice, and the parameter τ denotes a coefficient on the interaction between

the indicator for being in a CPC+ region and the indicator for being a CPC+ or comparison practice. ρ, σ, and, τ, are not included in Equation (5.F.1); they cannot be directly estimated because the model includes practice fixed effects. We include these terms in this table to illustrate the difference-in-difference-in-differences approach, but we show it in parentheses since we did not obtain the estimates. These parameters are differenced out in obtaining the impact estimate.

Non-comparison = unselected practices in comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year.

Model for the proportion of ambulatory primary care visits that are not face-to-face

Since non-face-to-face ambulatory primary care visits were essentially zero for both CPC+ and comparison practices prior to PY 4 (2020), we used an alternative specification for this outcome that did not use data prior to PY 4. In this model, we take the difference in the average outcome between CPC+ and non-CPC+ practices in PY 4 and subtract from that the difference in the average outcome between comparison and non-comparison practices in PY 4. The triple-differences model (which would then subtract the same quantity in the baseline year) would yield similar results since the quantity subtracted would be close to 0. The advantage of this model over a triple-differences specification is that it is more transparent about how the estimate is being identified. Our approach mirrors how we estimate the impacts of CPC+ on non-face-to-face ambulatory primary care visits in our main differences-in-differences analysis: we only compare outcomes among CPC+ practices to comparison practices in 2020, and not in prior years.

Specifically, we used the following specification. Let *i* index the beneficiary, and *j* index the practice. We estimated a double-differences regression model for beneficiaries assigned to CPC+ practices, selected comparison practices, non-CPC+ practices, and non-comparison practices during PY 4 only. The model had the following form:

$$y_{ij} = \alpha + \beta X_i + \gamma d_j + \delta s_j + \pi X_i s_j + \varphi d_j s_j + \theta a_j + \mu a_j s_j + \varepsilon_{ij} \quad \text{(5.F.2)}$$

where

y_{ij} represents the proportion of ambulatory primary care visits that were not face-to-face in PY 4, for beneficiary *i* in practice *j*.

X_i is a vector of characteristics of beneficiary *i* that includes those from Equation (5.F.1) as well as baseline Medicare expenditures and use of selected services to account for differences in health care utilization between beneficiaries assigned to CPC+ versus comparison practices before the start of CPC+. We describe the baseline Medicare expenditures and service use control variables in more detail below.

d_j is a vector of characteristics of practice *j* measured at baseline. We describe practice-level control variables in more detail below.

s_j (for "selected") is a binary indicator for being a CPC+ or comparison practice; the indicator takes the value of 1 if the practice *j* is a CPC+ practice or a comparison practice, and is 0 if practice *j* is a non-CPC+ practice or a non-comparison practice.

a_j (for "area") is a binary indicator for being in a CPC+ region; the indicator takes the value of 1 if the practice *j* is located in a CPC+ region and is 0 otherwise.

ε_{ij} is the idiosyncratic error term. It represents unexplained variability in the outcome variable for beneficiary *i* and in practice *j*.

$\hat{\mu}$ is the modified differences-in-differences impact estimate in PY 4. Table 5.F.3 summarizes how we used the parameter estimates from Equation (5.F.2) to obtain the regression-adjusted group means for CPC+ practices, comparison practices, non-CPC+ practices, and non-comparison practices in PY 4.

Table 5.F.3. Impact estimate and group means for CPC+ practices, comparison practices, non-CPC+ practices, and non-comparison practices for the non-face-to-face ambulatory primary care visit outcome based on a linear regression from Equation (5.F.2)

Comparison regions

Year	Comparison group mean	Non-comparison group mean	Difference between comparison and non-comparison group means	Difference-in-differences
PY 4	$\alpha + \pi + \varphi + \delta$	α	$\pi + \varphi + \delta$	N/A

CPC+ regions

Year	CPC+ group mean	Non-CPC+ group mean	Difference between CPC+ and non-CPC+ group means	Difference-in-differences
PY 4	$\alpha + \pi + \varphi + \theta + \delta + \mu$	$\alpha + \theta$	$\pi + \varphi + \delta + \mu$	μ

Notes: To highlight the key coefficients in Equation (5.F.2) above, we exclude the coefficients on beneficiary characteristics and practice characteristics in the expressions for group means in this table.

Non-comparison = unselected practices in comparison regions; non-CPC+ = non-participating practices in CPC+ regions.

Control variables

- **Main model controls.** We included the same set of beneficiary characteristics as in the main impact analysis in Chapter 5 (see Appendix 5.E, Table 5.E.4 for a list of beneficiary-level controls). To allow for the possibility that beneficiary characteristics might have different effects for beneficiaries in CPC+ or comparison practices than for beneficiaries in non-CPC+ or non-comparison practices, we interacted the beneficiary control variables with an indicator for whether the beneficiary was assigned to a CPC+ or comparison practice.
- **Model with COVID-19 controls.** The main differences-in-differences model includes a set of covariates that capture the magnitude of the pandemic within the state as well as the strength of state-level policy responses, including excess deaths in the state-HRR, the Pandemic Vulnerability Index in the county, the Government Response Index in the state, and the Social Vulnerability Index in the census tract. Additionally, each COVID-19-related variable is interacted with a year indicator for PY 4, to allow these variables to have different effects in the year prior to the pandemic (when they are likely less predictive of outcomes) to the year of the pandemic (Appendix 5.E). A key assumption in the triple-differences model is that non-CPC+ and non-comparison practices experienced impacts of COVID-19 that were comparable to their CPC+ and comparison counterparts, respectively. To test this assumption, we included these same COVID-19 related controls in the triple-differences model and tested whether they are additionally predictive of practices' outcomes. We also interacted them with an indicator for whether a beneficiary was assigned to a CPC+ or comparison practice, to allow for the possibility that beneficiary characteristics might have different effects for beneficiaries in CPC+ or comparison practices than for beneficiaries in non-CPC+ or non-comparison practices.
- **Non-face-to-face ambulatory primary care visits model controls.** Because the model for the proportion of ambulatory primary care visits that were not face-to-face compares CPC+, comparison, non-CPC+, and non-comparison practices only in PY 4, we could not include practice fixed-effects as the other models do.[106] Like the difference-in-differences model for telehealth outcomes in the main analysis, we instead included a vector of detailed practice and region characteristics, including primary care physician counts, system ownership, prior experience with a care transformation program, average household income, hospital beds per capita, Medicare Advantage penetration, and HRR-average price indices. In addition, to adjust for differences in health care utilization among beneficiaries attributed to the practice at baseline, we included the average monthly Medicare expenditures, annualized number of acute hospitalizations, outpatient ED visits, and ambulatory primary care visits at baseline, and an indicator for whether baseline Medicare expenditures and service utilization were missing at the practice level (Appendix 5.E). We also interacted each of these variables with an indicator for whether the beneficiary was assigned to a CPC+ or comparison practice.

[106] Practice fixed-effects capture time-invariant variation in practice characteristics and are therefore appropriate in models measuring practices' outcomes across multiple years. In the non-face-to-face ambulatory primary care visits model, we included only PY 4 data. Including practice fixed-effects would therefore eliminate the variation in CPC+, non-CPC+, comparison, and non-comparison practices' outcomes from which the impact estimate is derived.

C. Model estimation

Our model estimation approach was the same as in the main impact analysis:

- The regression sample included the baseline year (2016) and the four intervention years (PY 1, PY 2, PY 3, and PY 4) for all outcomes except the proportion of ambulatory primary care visits that were not face-to-face, which only includes the fourth intervention year (PY 4).
- We estimated Equations (5.F.1) and (5.F.2) as linear regressions, separately for Track 1 and Track 2, and also separately by SSP status within each track.
- All regressions accounted for non-independence across observations within the same practice, using standard error estimates clustered at the practice level.
- Each regression included practice fixed effects, except the model for proportion of ambulatory primary care visits that were not face-to-face, where practice-level controls were included.

D. Weighting

For beneficiaries in CPC+ or comparison practices, we applied the same weights as in the impact analysis in Chapter 5. That is, the final weight for beneficiaries in the comparison group was the product of the enrollment weight and the matching weight. For beneficiaries in the CPC+ group, we needed only the enrollment weight, because, by construction, the matching weight for each CPC+ beneficiary is 1.

For beneficiaries in non-CPC+ practices or non-comparison practices, the final weight was the product of the enrollment weight and the baseline concentration weight. We constructed the concentration weight at the state-HRR level such that non-CPC+ practices had the same level of representation (in terms of beneficiary months in the baseline year) as CPC+ practices of the same SSP-status in the same state and HRR, and likewise that non-comparison practices had the same level of representation as weighted comparison practices of the same SSP-status in the same state and HRR.[107,108]

E. Sensitivity analysis

We conducted the following sensitivity tests to assess the robustness of the findings from the triple-differences analysis:

- Alternate model specification including control variables related to COVID-19, interacted with whether the beneficiary was in a CPC+ or comparison practice (see Section 5.F.B of this

[107] The only exception to the balanced representation at the state-HRR level is for state-HRRs that had only CPC+ or comparison practices of a given SSP status, in which case there is no representation of non-participating practices or unselected practices of the same SSP status in those specific state-HRRs. We adjusted the concentration weight for practices that are in the same state for such cases so that the representation at state level was still balanced.

[108] We updated the concentration weight for the triple-differences analysis in the fourth annual report to ensure balance by SSP status and also to ensure that non-comparison practices had the same level of representation as *matching weighted* comparison practices.

Appendix). This tested whether non-CPC+ and non-comparison practices' outcomes accurately reflect the impacts of COVID-19 on CPC+ and comparison practices' outcomes. If variables that characterize the direct effects of COVID-19 have additional explanatory power in the triple-differences model, this would suggest that non-CPC+ and non-comparison practices' outcomes do not fully characterize the effects of COVID-19 on CPC+ and comparison practices.

- Winsorize the concentration weight at the 99th percentile. This test helped to check if extreme values of the concentration weight are driving the findings.
- Not use the concentration weight for non-CPC+ practices and non-comparison practices. If the number of practices (and their beneficiaries) changes differentially across the analysis groups during the intervention period (for example, due to differences in practice closures or COVID-19 related mortality), the *baseline* concentration weight may no longer lead to similar levels of geographic representation between analysis groups during the *intervention* period. As a result, the triple-differences model would not cancel out the regional shocks as intended. This check helped to assess if the findings are sensitive to the use of concentration weights.
- Exclude non-CPC+ practices (and non-comparison practices) that had the same Taxpayer Identification Number (TIN) as CPC+ (or comparison) practices.[109] This test helped to check if the triple-differences estimates are robust to the potential spillover of any favorable impact of CPC+ to non-participating practices owned by the same parent entity. If there are favorable spillovers, we would be netting out part of the effect of CPC+ in the triple-differences analysis, which would dilute the estimated effects of the intervention.
- Include only beneficiaries attributed in the first quarter of baseline and intervention period. This test checked whether or not the triple-differences estimates may be driven by differential trends in patient migration into and out of practices. If beneficiaries newly attributed to CPC+, comparison, non-CPC+, and non-comparison practices differ systematically over the intervention period, our impact estimates may reflect the changing composition of attributed beneficiaries rather than a causal impact of CPC+.[110]

F. Testing the triple-differences model assumption using baseline data

The triple-differences model assumes that, if the CPC+ program did not exist, the difference in trends (if a difference exists) between CPC+ and comparison practices would be similar to the difference in trends between non-CPC+ and non-comparison practices. Because we cannot observe counterfactual trends if CPC+ did not exist, we instead used quarterly data to test whether trend divergence (if any) between CPC+ and comparison practices was similar to trend divergence (if any) between non-CPC+ and non-comparison practices in the baseline period,

[109] Because excluding the TIN-sharing non-CPC+ practices changes the composition of practices in the non-CPC+ sample, we excluded non-comparison practices that share TINs with comparison practices to make the remaining sample of non-CPC+ and non-comparison practices more comparable.

[110] This may be particularly a concern for the triple-differences analysis because of the change in practice rosters from SK&A to OneKey in 2019. While we tracked CPC+ and comparison practices as closely as possible over the data transition, we did not do the same for other practices, including the non-CPC+ and non-comparison practices that were included in the triple-differences sample.

before CPC+ was implemented for the three main outcomes: (1) Medicare FFS expenditures without enhanced payments, (2) acute hospitalizations, and (3) outpatient ED visits.

For all outcomes and tracks, we could not reject the null hypothesis that trend divergence between CPC+ and comparison practices was similar to that between non-CPC+ practices and non-comparison practices. Although this does not definitively validate the triple-differences assumption, it is the closest we can to testing it.

Table 5.F.4. Results from testing that the trend divergence between CPC+ and comparison practices is similar to the trend divergence between non-CPC+ and non-comparison practices during the baseline quarters

	Track 1			Track 2		
	Estimated difference in trends[a] (SE)	90% confidence interval	*p*-value	Estimated difference in trends [a] (SE)	90% confidence interval	*p*-value
Medicare expenditures without enhanced payments per beneficiary per month	$0.2 ($2.5)	(-$4.0, $4.3)	0.948	-$3.2 ($2.8)	(-$7.8, $1.3)	0.242
Annualized acute hospitalizations per 1,000 beneficiaries	0.0 (1.2)	(-1.9, 2.0)	0.975	0.3 (1.4)	(-2.0, 2.5)	0.841
Outpatient ED visits per 1,000 beneficiaries	0.3 (2.0)	(-3.0, 3.6)	0.872	1.7 (2.3)	(-2.0, 5.4)	0.455

Source: Mathematica's analysis of Medicare claims data for January 2016–December 2016.

[a] Estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each estimate reflects the difference between (1) the trend divergence (if any) between CPC+ and comparison practices and (2) the trend divergence (if any) between non-CPC+ practices and non-comparison practices.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; HCC = hierarchical condition category; non-comparison = unselected practices in comparison regions; non-CPC+ = non-participating practices in CPC+ regions; SE = standard error.

5.F.4. Results

A. Triple-differences estimates

We find that, in general, the yearly and cumulative impacts estimates for Medicare expenditures and other outcomes from the triple-differences model are not statistically significant in either track. Tables 5.F.5 and 5.F.6 show the impacts estimated by the triple-differences model and the difference-in-differences models stated in terms of percentage impacts relative to the CPC+ outcome mean at baseline. Note that, for the Medicare expenditures, acute hospitalizations, and outpatient ED visit outcomes, positively signed impact estimates (that is, increases in utilization) reflect unfavorable effects of CPC+, while negatively signed effects (that is, reductions in utilization) reflect favorable effects of CPC+. For primary care visits and the proportion of primary care visits that were not face-to-face, it is not clear whether positive or negative estimates are favorable.

While the triple-differences model generally did not find significant impacts on outcomes across tracks and program years, there are a couple of exceptions. First, for primary care ambulatory care visits, the triple-differences model found significant annual effects across certain program years and tracks (in PY 1, a 0.9 and 1.0 percent reduction in Track 1 and 2, respectively; and in PY 3, a 1.2 percent increase in Track 1), but no statistically significant cumulative effect in either

track. Second, for the proportion of non-face-to-face primary care visits, the triple-differences model estimated that CPC+ led to a 4.6 percent increase for Track 2 practices in PY 4.

In contrast, estimates for several utilization measures from the difference-in-differences model show favorable statistically significant effects, particularly in later program years. These differences in statistical significance, which could lead us to draw different conclusions on the efficacy of CPC+, are due to the triple-differences estimates having larger standard errors (see Table 5.F.7) and the magnitude of the triple-differences estimates being generally slightly less favorable than the differences-in-differences estimates. In a couple of cases the differences in estimates between the two models are larger, and we should use caution in interpreting the results. However, given the general similarity in magnitude for most outcomes, most years, and for both tracks, both models suggest broadly comparable results.

In the next section, we describe in more detail the key differences between the difference-in-differences and triple-differences estimates, including variation in SSP-specific impact estimates.

Table 5.F.5. Summary table of estimated triple-differences and difference-in-differences impacts (in percentages) on expenditures and service use outcomes for Medicare FFS beneficiaries over the first four program years for Track 1 practices, by SSP participation status

		Overall		SSP		Non-SSP	
	Overall CPC+ mean	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]
Medicare expenditures (per beneficiary per month)							
Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP[d]							
PY 1	$899	0.7%	0.5%	0.8%	0.1%	0.6%	1.0%
PY 2	$951	1.0%	0.4%	1.1%	0.0%	0.8%	0.8%
PY 3	$995	0.6%	0.2%	0.2%	-0.8%	1.0%	1.4%
PY 4	$944	0.1%	-0.2%	-1.0%	-1.5%	1.3%	1.2%
PY 1 through PY 4	$949	0.6%	0.2%	0.3%	-0.6%	1.0%	1.1%
Service use (per 1,000 beneficiaries per year)							
Acute hospitalizations (short-stay acute care and critical access hospitals)							
PY 1	289	-0.1%	-0.2%	-0.5%	-0.9%	0.3%	0.5%
PY 2	285	0.1%	-0.7%	0.9%	-0.8%	-0.7%	-0.6%
PY 3	285	-0.2%	-1.0%	-0.7%	-1.7%**	0.5%	0.0%
PY 4	243	0.2%	-1.8%**	-0.5%	-3.3%***	1.1%	-0.4%
PY 1 through PY 4	275	0.0%	-0.9%*	-0.2%	-1.7%**	0.3%	-0.2%
Outpatient ED visits, including observation stays							
PY 1	490	0.0%	-1.1%**	-0.2%	-1.1%*	0.1%	-1.0%
PY 2	484	-0.6%	-1.5%***	-1.3%	-1.7%**	0.1%	-1.3%*
PY 3	485	-0.9%	-1.7%***	-1.4%	-1.6%**	-0.3%	-1.8%**
PY 4	377	-1.0%	-2.9%***	-1.1%	-3.8%***	-0.8%	-1.7%
PY 1 through PY 4	457	-0.6%	-1.8%***	-1.0%	-2.0%***	-0.2%	-1.5%**
Total urgent care center (UCC) visits							
PY 1	119	0.7%	0.3%	0.5%	1.2%	1.0%	-0.8%
PY 2	135	0.7%	2.0%	0.3%	4.5%**	1.1%	-1.2%
PY 3	149	1.9%	2.2%	-0.1%	2.2%	5.1%	2.4%
PY 4	150	3.2%	15.0%***	0.3%	13.1%***	8.1%	19.2%***
PY 1 through PY 4	139	2.1%	4.8%**	0.7%	5.1%***	4.2%	4.7%

	Overall CPC+ mean	Overall		SSP		Non-SSP	
		Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]
Ambulatory primary care visits (including FQHCs, RHCs, and CAHs)[e]							
PY 1	4,295	-0.9%**	-1.3%***	-0.4%	-1.1%**	-1.5%**	-1.5%***
PY 2	4,342	0.2%	-0.4%	0.6%	-0.1%	-0.3%	-0.8%
PY 3	4,410	1.2%*	0.0%	1.4%	0.1%	1.0%	-0.1%
PY 4	3,971	0.1%	-0.3%	-0.1%	-0.1%	0.4%	-0.4%
PY 1 through PY 4	4,249	0.2%	-0.5%	0.4%	-0.3%	-0.1%	-0.7%
Proportion of ambulatory primary care visits that are not face-to-face							
PY 4	0.16	1.1%	6.1%***	-3.4%	5.3%**	7.0%*	10.6%***

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] We calculated percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[b] Triple-differences impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the outcome for proportion of ambulatory primary care visits that were not face-to-face is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in PY 4, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in PY 4.

[c] Difference-in-differences impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that are not face-to-face reflect the difference between the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[d] Expenditures for Part A and Part B services in PY 3 and PY 4 include QPP payment adjustments, based on practitioner performance two years before. They are applicable for CPC+, comparison, non-CPC+, and non-comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims); and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on 2018 and 2019 claims for these practitioners, respectively). The first QPP adjustments were paid in PY 3 (two years after the start of QPP), so there are no QPP payments in PYs 1 and 2.

[e] Ambulatory visits with primary care practitioners and specialists include office-based visits and visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

*/**/*** Underlying impact estimate (which is in dollars PBPM for expenditures, per 1,000 beneficiaries per year for measures of service use) is significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

APM = Alternative Payment Model; CAH = critical access hospital; DD = differences-in-differences; ED = emergency department; FQHC = Federally Qualified Health Center; SSP = Medicare Shared Savings Program; RHC = Rural Health Clinic; PY = Program Year; QPP = Quality Payment Program.

Table 5.F.6. Summary table of estimated triple-differences and difference-in-differences impacts (in percentages) on expenditures and service use measures for Medicare FFS beneficiaries over the first four program years for Track 2 practices, by SSP participation status

		Overall		SSP		Non-SSP	
	Overall CPC+ mean	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]	Triple-differences percentage impact[a,b]	DD with COVID controls percentage impact[a,c]
Medicare expenditures (per beneficiary per month)							
Total Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP[d]							
PY 1	$897	0.5%	0.5%	0.5%	0.2%	0.6%	0.9%
PY 2	$950	0.5%	0.5%	-0.4%	-0.2%	1.4%*	1.1%**
PY 3	$990	0.0%	-0.2%	-0.1%	-0.7%	0.2%	0.2%
PY 4	$940	-0.1%	-0.3%	-0.8%	-1.3%	0.4%	0.8%
PY 1 through PY 4	$946	0.3%	0.1%	-0.1%	-0.6%	0.6%	0.7%
Service use (per 1,000 beneficiaries per year)							
Acute hospitalizations (short-stay acute care and critical access hospitals)							
PY 1	292	-0.2%	-0.2%	0.0%	-0.1%	-0.3%	-0.2%
PY 2	289	-0.5%	-0.5%	-0.7%	0.0%	-0.3%	-1.0%
PY 3	287	-1.1%	-1.7%***	0.1%	-0.6%	-2.1%*	-2.6%***
PY 4	245	-0.7%	-1.9%**	0.3%	-1.4%	-1.6%	-2.1%**
PY 1 through PY 4	277	-0.6%	-1.1%**	0.1%	-0.6%	-1.1%	-1.6%**
Outpatient ED visits, including observation stays							
PY 1	486	-0.1%	-1.5%***	-0.2%	-1.9%***	-0.1%	-1.3%**
PY 2	484	-0.7%	-1.3%**	-1.9%	-1.7%**	0.1%	-1.1%
PY 3	484	-1.2%	-1.6%**	-2.7%	-1.6%*	0.0%	-1.6%*
PY 4	377	0.8%	-2.5%***	-1.2%	-5.1%***	2.5%	-0.3%
PY 1 through PY 4	455	-0.4%	-1.7%***	-1.5%	-2.5%***	0.5%	-1.2%
Total urgent care center (UCC) visits							
PY 1	111	1.7%	0.9%	1.2%	3.2%	1.9%	-1.0%
PY 2	124	1.6%	1.6%	-0.6%	6.5%	3.3%	-2.4%
PY 3	134	1.0%	-1.8%	-2.0%	-0.4%	3.0%	-3.0%
PY 4	132	2.3%	7.4%**	-0.7%	8.1%*	4.8%	6.5%*
PY 1 through 4	126	1.7%	2.0%	-0.4%	4.2%	3.3%	0.1%
Ambulatory primary care visits (including to FQHCs, RHCs, and CAHs)[e]							
PY 1	4,364	-1.0%*	-1.6%***	0.1%	-1.1%**	-1.8%***	-2.0%***
PY 2	4,397	-0.7%	-1.0%**	-0.6%	-0.6%	-0.8%	-1.3%
PY 3	4,453	-0.3%	-0.8%	-0.3%	-0.4%	-0.4%	-1.2%
PY 4	3,995	-1.0%	-0.7%	-1.6%	0.0%	-0.5%	-1.0%
PY 1 through PY 4	4,295	-0.7%	-1.0%**	-0.5%	-0.5%	-0.9%	-1.4%**
Proportion of ambulatory primary care visits that are not face-to-face							
PY 4	0.17	4.6%*	14.6%***	1.6%	10.4%***	5.5%*	13.6%***

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Table 5.F.6 *(continued)*

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the p-values, findings on related outcomes, and sensitivity tests.

[a] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[b] Triple-differences impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the outcome for proportion of ambulatory primary care visits that were not face-to-face is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in PY 4, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in PY 4.

[c] Difference-in-differences impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[d] Expenditures for Part A and Part B services in PY 3 and PY 4 include QPP payment adjustments, based on practitioner performance two years before. They are applicable for CPC+, comparison, non-CPC+, and non-comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims); and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on 2018 and 2019 claims for these practitioners, respectively). The first QPP adjustments were paid in PY 3 (two years after the start of QPP), so there are no QPP payments in PYs 1 and 2.

[e] Ambulatory visits with primary care practitioners and specialists include office-based visits and visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

*/**/*** Underlying impact estimate (which is in dollars PBPM for expenditures, per 1,000 beneficiaries per year for measures of service use) is significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

APM = Alternative Payment Model; CAH = critical access hospital; DD = differences-in-differences; DDD = triple-differences; ED = emergency department; FQHC = Federally Qualified Health Center; SSP = Medicare Shared Savings Program; RHC = Rural Health Clinic; PY = Program Year; QPP = Quality Payment Program.

B. Detailed comparison of triple differences with difference-in-differences results

In this section, we compare the triple-differences model estimates to the difference-in-difference model estimates. As described above, the confidence intervals for the triple-differences estimates are often larger than for the difference-in-differences estimate. As a result, sometimes the difference-in-differences is significant when the triple-differences is not. However, when the difference-in-differences estimates falls within the triple-differences 90 percent confidence interval, we determine that the two models are aligned and are not substantially different from each other.

To make comparisons between the two models for each outcome easier, we plot impact estimates across years and summarize our findings in a table. Specifically, Figure 5.F.1 plots the impact estimates and their 90 percent confidence intervals from both sets of models for expenditures, acute hospitalizations, outpatient ED visits, primary care visits, and urgent care center visits, cumulatively and by program year, for Tracks 1 and 2 separately. Table 5.F.7 summarizes the point estimates, significance levels, and whether there are significant differences between the triple-differences and difference-in-differences models (which is based on whether the difference-in-differences estimate was within the 90 percent confidence interval for the triple-differences estimate).

For the main estimates, we highlight results where the difference-in-differences or triple-differences models find significant effects. For the SSP-specific models, we only highlight results where the difference-in-differences estimates are substantially different from the triple-differences results.

1. **Medicare expenditures, excluding enhanced payments**

- For both tracks overall, the difference-in-differences and triple-differences models demonstrated no significant impacts of CPC+ on expenditures, cumulatively or annually (Tables 5.F.8 and 5.F.9).
- For both tracks, the SSP-specific difference-in-differences estimates are not substantially different from the triple-differences estimates (Tables 5.F.10 and 5.1).

2. **Acute hospitalizations**

- In Track 1 overall, the difference-in-differences model shows increasingly negative impacts that become statistically significant in PY 4 (a reduction of 4.5 hospitalizations per 1,000 beneficiaries), and this estimate is not contained within the triple-differences estimate's 90 percent confidence interval.
  - This finding suggests that the difference-in-differences estimate could potentially be biased in PY4 due to insufficiently controlling for differences in outcomes due to COVID-19 or other regional trends and requires cautious interpretation.
  - In Track 2 overall, the statistically significant difference-in-differences model estimates (a reduction of 5.0 and 4.7 hospitalizations per 1,000 beneficiaries, for PY 3 and PY 4, respectively) are not substantially different from the triple-differences estimates.

  - Among Track 1 non-SSP practices and Track 2 SSP and non-SSP practices, the difference-in-differences and triple-differences models are not substantially different.
  - However, among Track 1 SSP practices, the difference-in-differences estimate shows reductions in acute hospitalizations which are statistically significant in PY 3 and PY 4 (-5.1 and -8.2 visits per 1,000 beneficiaries, respectively). The triple-differences estimate shows no impacts, and the difference-in-differences PY 4 estimate *is not contained* within the triple-differences estimate's 90 percent confidence interval, suggesting that the difference-in-differences estimates should be cautiously interpreted.
  - Given there is some inconsistency between the difference-in-differences and triple-differences Track 1 results overall and in the Track 1 SSP subgroup, we will interpret these estimates for acute hospitalizations cautiously.

3. **Outpatient ED visits**

- In Track 1 overall, the difference-in-differences model estimates increasingly negative statistically significant impacts over the program years (with a cumulative reduction of 8.3 visits per beneficiaries per year), and these are not substantially different from the triple-differences estimates.
- In Track 2 overall, the difference-in-differences model's annual estimates are all statistically significantly negative, however, the estimates in PY 1 and PY 4 (a reduction of 7.6 and 9.6 visits per 1,000 beneficiaries per year, respectively) are not contained within the triple-differences estimates' 90 percent confidence intervals. For PY 4, this is partly due to the triple-difference estimate jumping from -5.8 visits in PY 3 to 3.9 visits in PY 4, and also the difference-in-differences estimate declining from -7.6 to 9.3 visits from PY 3 to PY 4. In this case, given the large jump in the triple-differences estimate, which is unlikely to represent a true effect of CPC+, we have less confidence in the triple-differences estimate. It is still possible that the difference-in-differences estimate reflects regional trends in addition to any true CPC+ effect, so to be conservative, the magnitude of the estimate should be interpreted with caution.
- The impact estimates for the two models align for the Track 1 SSP and non-SSP impact analyses and for Track 2 non-SSP practices. However, there are some differences in the impact estimates for Track 2 SSP practices:
  - Among Track 2 SSP practices, the difference-in-differences model shows a reduction of 19.3 visits per 1,000 beneficiaries per year in PY 4, which is *not contained* within the triple-differences model estimate's 90 percent confidence interval.
- Given there is inconsistency between the difference-in-differences and triple-differences Track 2 results overall and in the Track 2 SSP, we will interpret these estimates for ED visits cautiously.

4. **Urgent care center visits**

- In Track 1 overall, the difference-in-differences model shows an increase of 19.7 urgent care center visits per 1,000 beneficiaries per year in PY 4, which is a large jump from the previous year (3.2 visits in PY 3). This estimate is not contained within the triple-differences model estimates' 90 percent confidence interval. Given this, and the large jump in magnitude of the Track 1 PY 4 estimate, we will interpret this result with caution.

- In Track 2 overall, the differences-in-differences model estimates an increase of 9.1 urgent care visits per 1,000 beneficiaries per year in PY 4, but this estimate is not substantially different from the triple-differences estimates.
- Results do not differ substantially between the difference-in-differences and triple-differences models for any of the SSP subgroups.

5. **Ambulatory primary care visits**

- In both Tracks, the difference-in-differences cumulative estimates are not substantially different from the triple-differences estimates:
  - For Track 1 overall, both models find insignificant effects.
  - For Track 2 overall, the difference-in-differences model estimates a reduction of 44.2 visits per 1,000 beneficiaries, which is not substantially different from the triple-differences model estimate.
- The annual estimates are mostly consistent between the two models:
  - In PY 1, both the triple-differences and difference-in-differences model estimate significant reductions in ambulatory primary care visits (-40.0 visits per 1,000 beneficiaries for the triple-differences Track 1 model, and -55.3 visits for the difference-in-differences Track 1 model; -42.5 visits for the triple-differences Track 2 model and -71.0 visits for the difference-in-differences Track 2 model).
  - In PY 2, for Track 2 overall, the difference-in-differences model estimates a significant 45.2 reduction in visits, which is not substantially different from the triple-differences estimate.
  - However, in PY 3, the difference-in-differences model shows no effect while the triple-differences model estimates an increase of 51.6 visits, and the difference-in-differences estimate is not contained within the triple-differences 90 percent confidence intervals. In this case, the triple-differences estimate is a jump between PY 2 and PY 4 (where the estimates were 9.4 and 5.2 visits, respectively), so we will interpret the triple-differences effect with caution.
  - In PY 4, both models show no significant impacts in Track 1 or Track 2.
- Across both SSP subgroups in each track, the difference-in-differences model's annual and cumulative estimates are not substantially different from the triple-differences model estimates.

6. **The proportion of ambulatory primary care visits that were not face-to-face.**

- In Track 1 overall, the difference-in-differences model estimates a 1 percentage point increase in the proportion of ambulatory primary care visits that were not face-to-face, while the triple-differences model shows no effect. The differences-in-differences estimate is not contained in the triple-differences estimate's 90 percent confidence interval, suggesting the difference-in-differences estimate should be interpreted with caution.
- In Track 2 overall, both the difference-in-differences and triple-differences models estimate statistically significant impacts (2 and 1 percentage points, respectively).

- In both tracks, the difference-in-differences and triple differences models are aligned for non-SSP practices, but there are some differences among SSP practices:
  - Among non-SSP practices in both tracks, the difference-in-differences and triple-differences models estimate statistically significant positive impacts.
  - Among SSP practices in both tracks, only the difference-in-differences model estimates significant positive impacts, and these estimates are *not contained* within the triple-differences model estimates' 90 percent confidence intervals.

Figure 5.F.1. Yearly and cumulative triple-differences [a] and difference-in-differences [b] model impact estimates, for expenditures, acute hospitalizations, outpatient ED visits, urgent care center visits, and ambulatory primary care visits, separately by track.

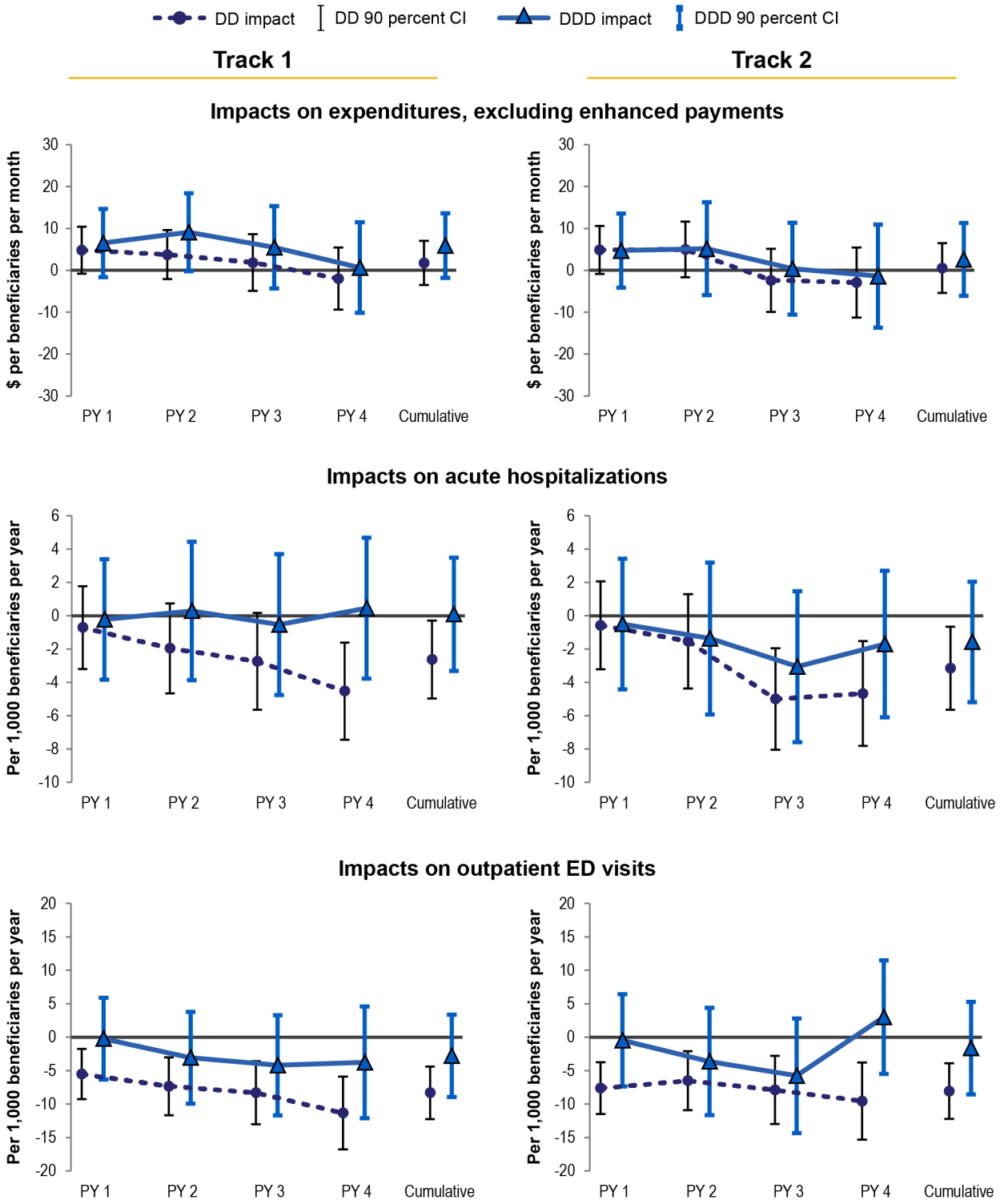
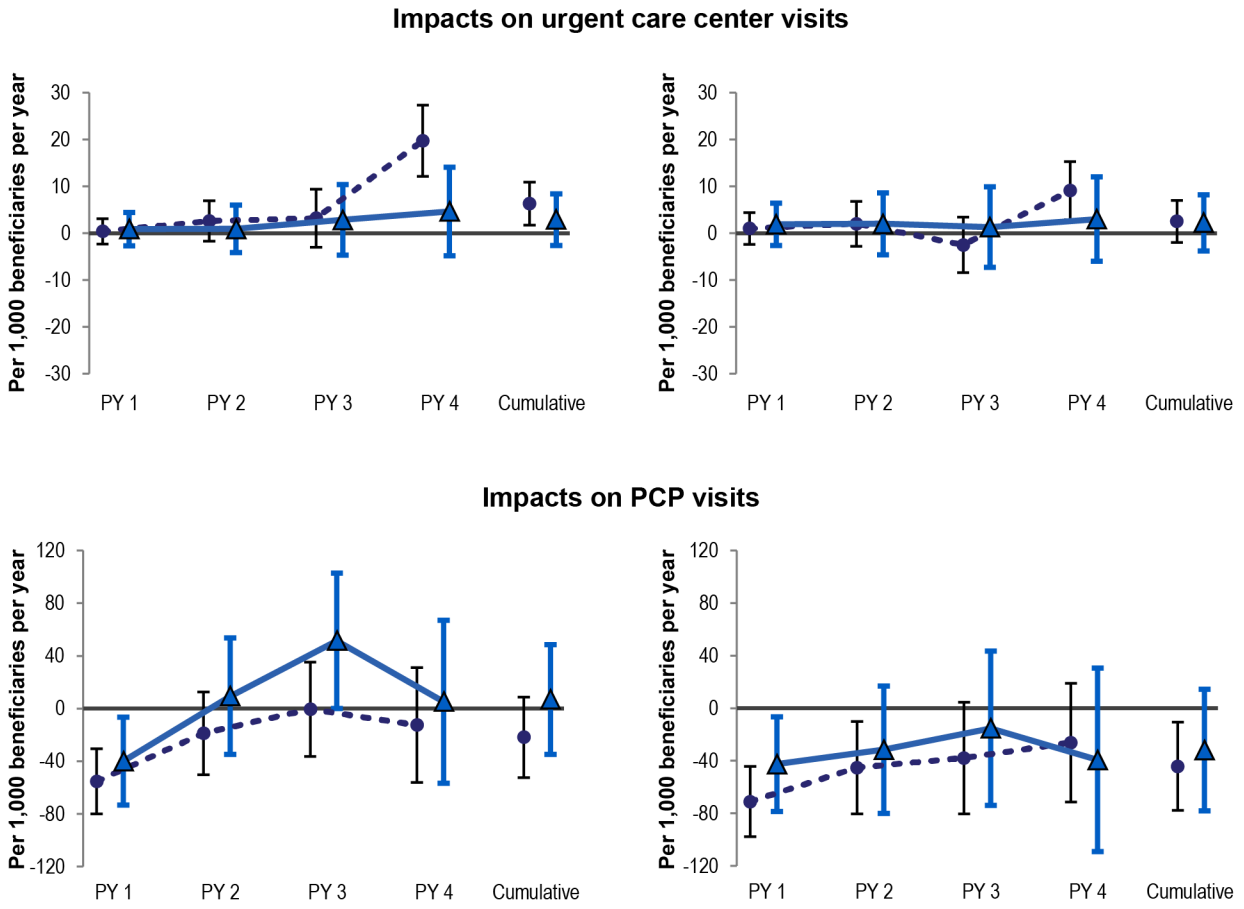


Figure 5.F.1 *(continued)*



Source: Mathematica's analyses of Medicare claims data from January 2013 through December 2020.

[a] Triple-differences impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the outcome for proportion of ambulatory primary care visits that were not face-to-face is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

[b] Difference-in-differences impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

DD = difference-in-differences; DDD = triple-differences; ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; PCP = primary care practitioner; PY = Program Year.

Table 5.F.7. Summary table of estimated triple-differences and difference-in-differences impact point estimates on expenditures and service use measures for Medicare FFS beneficiaries over the first four program years, by track

	Track 1			Track 2		
Program Year	DDD impact estimate[a]	DD impact estimate[b]	DD within DDD 90% CI[c]	DDD impact estimate[a]	DD impact estimate[b]	DD within DDD 90% CI[c]
Medicare expenditures (per beneficiary per month)						
Total Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP[d]						
PY 1	$6.5 ($4.9)	$4.8 ($3.4)	Yes	$4.7 ($5.4)	$4.9 ($3.5)	Yes
PY 2	$9.1 ($5.7)	$3.8 ($3.6)	Yes	$5.2 ($6.7)	$5.0 ($4.0)	Yes
PY 3	$5.5 ($6.0)	$1.9 ($4.1)	Yes	$0.4 ($6.7)	-$2.4 ($4.6)	Yes
PY 4	$0.6 ($6.6)	-$2.0 ($4.5)	Yes	-$1.4 ($7.5)	-$2.9 ($5.1)	Yes
PY 1 through PY 4	$5.9 ($4.7)	$1.8 ($3.2)	Yes	$2.6 ($5.3)	$0.6 ($3.6)	Yes
Service use (per 1,000 beneficiaries per year)						
Acute hospitalizations (short-stay acute care and critical access hospitals)						
PY 1	-0.2 (2.2)	-0.7 (1.5)	Yes	-0.5 (2.4)	-0.6 (1.6)	Yes
PY 2	0.3 (2.5)	-2.0 (1.6)	Yes	-1.4 (2.8)	-1.5 (1.7)	Yes
PY 3	-0.5 (2.6)	-2.7 (1.8)	Yes	-3.1 (2.8)	-5.0*** (1.9)	Yes
PY 4	0.5 (2.6)	-4.5** (1.8)	No	-1.7 (2.7)	-4.7** (1.9)	Yes
PY 1 through PY 4	0.1 (2.1)	-2.6* (1.4)	Yes	-1.6 (2.2)	-3.2** (1.5)	Yes
Outpatient ED visits, including observation stays						
PY 1	-0.2 (3.7)	-5.5** (2.3)	Yes	-0.5 (4.2)	-7.6*** (2.4)	No
PY 2	-3.1 (4.2)	-7.3*** (2.6)	Yes	-3.6 (4.9)	-6.5** (2.7)	Yes
PY 3	-4.2 (4.6)	-8.3*** (2.9)	Yes	-5.8 (5.2)	-7.9** (3.1)	Yes
PY 4	-3.8 (5.1)	-11.3*** (3.3)	Yes	3.0 (5.2)	-9.6*** (3.5)	No
PY 1 through PY 4	-2.8 (3.7)	-8.3*** (2.4)	Yes	-1.6 (4.2)	-8.1*** (2.5)	Yes
Total urgent care center (UCC) visits						
PY 1	0.9 (2.2)	0.4 (1.7)	Yes	1.9 (2.7)	1.0 (2.1)	Yes
PY 2	0.9 (3.1)	2.6 (2.6)	Yes	2.0 (4.0)	2.0 (2.9)	Yes
PY 3	2.8 (4.6)	3.2 (3.8)	Yes	1.3 (5.2)	-2.5 (3.6)	Yes
PY 4	4.6 (5.8)	19.7*** (4.6)	No	3.0 (5.5)	9.1** (3.8)	Yes
PY 1 through PY 4	2.9 (3.3)	6.3** (2.7)	Yes	2.2 (3.7)	2.5 (2.8)	Yes
Ambulatory PCP visits (including to FQHCs, RHCs, and CAHs)[e]						
PY 1	-40.0** (20.3)	-55.3*** (15.1)	Yes	-42.5* (21.9)	-71.0*** (16.3)	Yes
PY 2	9.4 (26.9)	-18.8 (19.1)	Yes	-31.5 (29.4)	-45.2** (21.4)	Yes
PY 3	51.6* (31.3)	-0.5 (21.8)	No	-15.3 (35.7)	-37.9 (25.8)	Yes
PY 4	5.2 (37.6)	-12.5 (26.5)	Yes	-39.3 (42.4)	-26.2 (27.4)	Yes
PY 1 through PY 4	6.9 (25.4)	-21.9 (18.6)	Yes	-31.8 (28.1)	-44.2** (20.4)	Yes
Proportion of ambulatory primary care visits that are non-face-to-face						
PY 4	0.0017 (0.003)	0.009*** (0.003)	No	0.007* (0.004)	0.022*** (0.003)	No

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests. Red highlighted cells indicate sets of estimates where the difference-in-differences estimate is not contained within the triple-differences estimate.

[a] Triple-differences impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate (except for the outcome for proportion of ambulatory primary care visits that were not face-to-face) is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in PY 4, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in PY 4.

[b] Difference-in-differences impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[c] This column indicates whether the point estimate from the differences-in-differences model lies within the 90 percent confidence interval of the corresponding estimate from the triple-differences model.

Table 5.F.7 *(continued)*

[d] Expenditures for Part A and Part B services in PY 3 and PY 4 include QPP payment adjustments, based on practitioner performance two years before. They are applicable for CPC+, comparison, non-CPC+, and non-comparison practices. The adjustments are composed of (1) MIPS adjustments, which are applied directly to physician and outpatient claims (as a percentage of the charges on the claims); and (2) lump sum incentive payments to eligible practitioners who participated in Advanced APMs in 2017 and 2018 (calculated based on 2018 and 2019 claims for these practitioners, respectively). The first QPP adjustments were paid in PY 3 (two years after the start of QPP), so there are no QPP payments in PYs 1 and 2.

[e] Ambulatory visits with primary care practitioners and specialists include office-based visits and visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

APM = Alternative Payment Model; CAH = critical access hospital; DD = differences-in-differences; DDD = triple-differences; ED = emergency department; FFS = fee-for-service; FQHC = Federally Qualified Health Center; SSP = Medicare Shared Savings Program; RHC = Rural Health Clinic; PY = Program Year; QPP = Quality Payment Program.

Table 5.F.8. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 1

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID-19 controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)												
Total Medicare Part A and B expenditures without enhanced payments for CPC+ and SSP												
Baseline	$881	$884	$938	$936	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$899	$898	$956	$956	$6.5 ($4.9)	0.7%	(-$1.6, $14.7)	0.188	$4.8 ($3.4)	0.5%	(-$0.8, $10.4)	0.156
PY 2	$951	$949	$1,006	$1,008	$9.1 ($5.7)	1.0%	(-$0.2, $18.4)	0.109	$3.8 ($3.6)	0.4%	(-$2.1, $9.6)	0.292
PY 3	$995	$997	$1,050	$1,051	$5.5 ($6.0)	0.6%	(-$4.3, $15.3)	0.357	$1.9 ($4.1)	0.2%	(-$4.9, $8.6)	0.650
PY 4	$944	$955	$1,000	$1,006	$0.6 ($6.6)	0.1%	(-$10.2, $11.5)	0.921	-$2.0 ($4.5)	-0.2%	(-$9.4, $5.4)	0.660
PY 1 through PY 4	$949	$952	$1,000	$1,003	$5.9 ($4.7)	0.6%	(-$1.8, $13.6)	0.207	$1.8 ($3.2)	0.2%	(-$3.5, $7.0)	0.580
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	290	289	320	305	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	289	288	319	305	-0.2 (2.2)	-0.1%	(-3.8, 3.4)	0.918	-0.7 (1.5)	-0.2%	(-3.2, 1.8)	0.638
PY 2	285	285	318	305	0.3 (2.5)	0.1%	(-3.9, 4.4)	0.909	-2.0 (1.6)	-0.7%	(-4.7, 0.7)	0.234
PY 3	285	286	317	305	-0.5 (2.6)	-0.2%	(-4.8, 3.7)	0.836	-2.7 (1.8)	-1.0%	(-5.6, 0.2)	0.121
PY 4	243	247	275	265	0.5 (2.6)	0.2%	(-3.8, 4.7)	0.860	-4.5** (1.8)	-1.8%	(-7.5, -1.6)	0.011
PY 1 through PY 4	275	276	304	292	0.1 (2.1)	0.0%	(-3.3, 3.5)	0.966	-2.6* (1.4)	-0.9%	(-5.0, -0.3)	0.064
Outpatient ED visits, including observation stays												
Baseline	493	498	547	547	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	490	500	545	551	-0.2 (3.7)	0.0%	(-6.3, 5.9)	0.952	-5.5** (2.3)	-1.1%	(-9.3, -1.8)	0.016
PY 2	484	496	541	545	-3.1 (4.2)	-0.6%	(-9.9, 3.8)	0.463	-7.3*** (2.6)	-1.5%	(-11.7, -3.0)	0.005
PY 3	485	498	540	544	-4.2 (4.6)	-0.9%	(-11.7, 3.3)	0.356	-8.3*** (2.9)	-1.7%	(-13.0, -3.6)	0.004
PY 4	377	393	429	437	-3.8 (5.1)	-1.0%	(-12.1, 4.6)	0.457	-11.3*** (3.3)	-2.9%	(-16.8, -5.9)	0.001
PY 1 through PY 4	457	470	511	517	-2.8 (3.7)	-0.6%	(-9.0, 3.4)	0.456	-8.3*** (2.4)	-1.8%	(-12.2, -4.4)	0.001
Total urgent care center (UCC) visits												
Baseline	104	111	92	99	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	119	124	104	111	0.9 (2.2)	0.7%	(-2.7, 4.4)	0.689	0.4 (1.7)	0.3%	(-2.4, 3.1)	0.831
PY 2	135	138	112	116	0.9 (3.1)	0.7%	(-4.1, 6.0)	0.763	2.6 (2.6)	2.0%	(-1.6, 6.9)	0.311
PY 3	150	153	125	130	2.8 (4.6)	1.9%	(-4.7, 10.4)	0.536	3.2 (3.8)	2.2%	(-3.0, 9.4)	0.398
PY 4	151	141	130	123	4.6 (5.8)	3.2%	(-4.8, 14.1)	0.420	19.7*** (4.6)	15.0%	(12.0, 27.3)	0.000
PY 1 through PY 4	139	140	117	120	2.9 (3.3)	2.1%	(-2.6, 8.4)	0.388	6.3** (2.7)	4.8%	(1.8, 10.9)	0.021

Table 5.F.8 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID-19 controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Ambulatory primary care visits												
Baseline	4,255	4,370	4,586	4,627	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	4,295	4,465	4,657	4,713	-40.0** (20.3)	-0.9%	(-73.4, -6.6)	0.049	-55.3*** (15.1)	-1.3%	(-80.0, -30.5)	0.000
PY 2	4,342	4,474	4,629	4,696	9.4 (26.9)	0.2%	(-34.9, 53.6)	0.728	-18.8 (19.1)	-0.4%	(-50.2, 12.6)	0.325
PY 3	4,410	4,524	4,633	4,723	51.6* (31.3)	1.2%	(0.1, 103.0)	0.099	-0.5 (21.8)	0.0%	(-36.4, 35.4)	0.981
PY 4	3,971	4,113	4,209	4,283	5.2 (37.6)	0.1%	(-56.6, 67.0)	0.890	-12.5 (26.5)	-0.3%	(-56.1, 31.0)	0.636
PY 1 through PY 4	4,249	4,388	4,547	4,618	6.9 (25.4)	0.2%	(-34.8, 48.6)	0.785	-21.9 (18.6)	-0.5%	(-52.4, 8.7)	0.239
Proportion of ambulatory primary care visits that were not face-to-face												
PY 4	0.16	0.15	0.15	0.14	0.00 (0.00)	1.1%	(0.00, 0.01)	0.653	0.01*** (0.00)	6.1%	(0.00, 0.01)	0.005
Unweighted sample sizes												
Number of practices	1,373	5,243	8,337	20,656								
Number of beneficiaries	1,458,158	4,945,126	3,844,893	10,918,888								
Number of beneficiary years[e]	4,883,660	16,421,020	12,838,323	36,837,876								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between the regression-adjusted average outcomes for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

Table 5.F.8 *(continued)*

[e] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 29.6 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 15.9 percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 45.8 percent of the size of the actual comparison group. Because the CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.8 percent of the actual sample size.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; NA. = not applicable; non-comparison = unselected practices in comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

Table 5.F.9. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 2

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (Per beneficiary per month)												
Total Medicare Part A and B expenditures without additional payments												
Baseline	$876	$879	$928	$931	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$897	$895	$950	$954	$4.7 ($5.4)	0.5%	(-$4.1, 13.6)	0.381	$4.9 ($3.5)	0.5%	(-$0.8, $10.6)	0.160
PY 2	$950	$948	$1,005	$1,008	$5.2 ($6.7)	0.5%	(-$5.9, $16.2)	0.443	$5.0 ($4.0)	0.5%	(-$1.6, $11.6)	0.215
PY 3	$990	$996	$1,055	$1,061	$0.4 ($6.7)	0.0%	(-$10.6, 11.3)	0.956	-$2.4 ($4.6)	-0.2%	(-$9.9, $5.2)	0.606
PY 4	$940	$951	$999	$1,010	-$1.4 ($7.5)	-0.1%	(-$13.7, 10.9)	0.853	-$2.9 ($5.1)	-0.3%	(-$11.3, $5.4)	0.566
PY 1 through PY 4	$946	$950	$998	$1,005	$2.6 ($5.3)	0.3%	(-$6.1, $11.3)	0.622	$0.6 ($3.6)	0.1%	(-$5.4, $6.5)	0.878
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	292	289	319	307	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	292	289	320	308	-0.5 (2.4)	-0.2%	(-4.4, 3.4)	0.835	-0.6 (1.6)	-0.2%	(-3.2, 2.1)	0.719
PY 2	289	287	320	308	-1.4 (2.8)	-0.5%	(-5.9, 3.2)	0.622	-1.5 (1.7)	-0.5%	(-4.4, 1.3)	0.373
PY 3	287	288	320	309	-3.1 (2.8)	-1.1%	(-7.6, 1.5)	0.267	-5.0*** (1.9)	-1.7%	(-8.1, -2.0)	0.007
PY 4	245	246	277	268	-1.7 (2.7)	-0.7%	(-6.1, 2.7)	0.525	-4.7** (1.9)	-1.9%	(-7.8, -1.5)	0.015
PY 1 through PY 4	277	277	306	295	-1.6 (2.2)	-0.6%	(-5.2, 2.0)	0.475	-3.2** (1.5)	-1.1%	(-5.7, -0.7)	0.037
Outpatient ED visits, including observation stays												
Baseline	492	491	565	552	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	486	492	560	554	-0.5 (4.2)	-0.1%	(-7.4, 6.4)	0.909	-7.6*** (2.4)	-1.5%	(-11.5, -3.8)	0.001
PY 2	484	488	558	547	-3.6 (4.9)	-0.7%	(-11.7, 4.4)	0.456	-6.5** (2.7)	-1.3%	(-10.9, -2.1)	0.015
PY 3	484	490	556	545	-5.8 (5.2)	-1.2%	(-14.3, 2.8)	0.268	-7.9** (3.1)	-1.6%	(-13.0, -2.8)	0.011
PY 4	377	386	443	443	3.0 (5.2)	0.8%	(-5.5, 11.5)	0.560	-9.6*** (3.5)	-2.5%	(-15.3, -3.8)	0.006
PY 1 through PY 4	455	462	527	521	-1.6 (4.2)	-0.4%	(-8.5, 5.3)	0.698	-8.1*** (2.5)	-1.7%	(-12.2, -3.9)	0.001
Total urgent care center (UCC) visits												
Baseline	97	105	94	94	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	111	118	105	106	1.9 (2.7)	1.7%	(-2.6, 6.4)	0.483	1.0 (2.1)	0.9%	(-2.5, 4.4)	0.637
PY 2	124	130	112	111	2.0 (4.0)	1.6%	(-4.5, 8.6)	0.611	2.0 (2.9)	1.6%	(-2.9, 6.8)	0.504
PY 3	134	145	124	127	1.3 (5.2)	1.0%	(-7.4, 9.9)	0.808	-2.5 (3.6)	-1.8%	(-8.5, 3.4)	0.489
PY 4	132	136	122	120	3.0 (5.5)	2.3%	(-6.0, 12.0)	0.582	9.1** (3.8)	7.4%	(2.8, 15.3)	0.017
PY 1 through PY 4	126	133	116	116	2.2 (3.7)	1.8%	(-3.8, 8.2)	0.550	2.5 (2.8)	2.0%	(-2.1, 7.0)	0.373

Table 5.F.9 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Ambulatory primary care visits												
Baseline	4,361	4,430	4,597	4,650	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	4,364	4,502	4,666	4,746	-42.5* (21.9)	-1.0%	(-78.5, -6.6)	0.052	-71.0*** (16.3)	-1.6%	(-97.8, -44.2)	0.000
PY 2	4,397	4,508	4,639	4,703	-31.5 (29.4)	-0.7%	(-79.9, 16.9)	0.284	-45.2** (21.4)	-1.0%	(-80.4, -10.0)	0.035
PY 3	4,453	4,558	4,643	4,717	-15.3 (35.7)	-0.3%	(-74.0, 43.5)	0.669	-37.9 (25.8)	-0.8%	(-80.4, 4.6)	0.143
PY 4	3,995	4,128	4,198	4,276	-39.3 (42.4)	-1.0%	(-109.0, 30.5)	0.354	-26.2 (27.4)	-0.7%	(-71.3, 19.0)	0.340
PY 1 through PY 4	4,295	4,417	4,555	4,629	-31.8 (28.1)	-0.7%	(-78.0, 14.4)	0.258	-44.2** (20.4)	-1.0%	(-77.7, -10.7)	0.030
Proportion of ambulatory primary care visits that were not face-to-face												
PY 4	0.17	0.15	0.23	0.22	0.01* (0.00)	4.6%	(0.00, 0.01)	0.091	0.02*** (0.00)	14.6%	(0.02, 0.03)	0.000
Unweighted sample sizes												
Number of practices	1,515	3,783	7,276	20,115								
Number of beneficiaries	1,775,193	4,184,439	3,234,914	10,640,530								
Number of beneficiary years[e]	5,945,033	13,923,421	10,678,234	35,891,642								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcomes for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

Table 5.F.9 *(continued)*

[e] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 28.9 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 11.8 percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 40.2 percent of the size of the actual comparison group. Because CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.7 percent of the actual sample size.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; n.a. = not applicable; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

Table 5.F.10. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 1 SSP Practices

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)												
Total Medicare Part A and B expenditures without additional payments												
Baseline	$906	$905	$966	$955	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$924	$922	$985	$979	$7.3 ($7.2)	0.8%	(-$4.5, $19.2)	0.307	$1.4 ($4.5)	0.1%	(-$6.1, $8.8)	0.765
PY 2	$975	$974	$1,039	$1,038	$10.6 ($8.6)	1.1%	(-$3.5, $24.7)	0.217	$0.0 ($4.9)	0.0%	(-$8.0, $8.0)	1.000
PY 3	$1,018	$1,025	$1,089	$1,088	$2.1 ($8.7)	0.2%	(-$12.2, $16.4)	0.809	-$8.5 ($5.5)	-0.8%	(-$17.5, $0.5)	0.122
PY 4	$962	$977	$1,025	$1,020	-$9.9 ($9.3)	-1.0%	(-$25.2, $5.4)	0.288	-$14.9** ($6.4)	-1.5%	(-$25.5, -$4.4)	0.020
PY 1 through PY 4	$971	$977	$1,031	$1,029	$2.8 ($6.9)	0.3%	(-$8.5, $14.1)	0.682	-$5.9 ($4.4)	-0.6%	(-$13.1, $1.3)	0.176
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	291	289	321	304	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	289	290	322	306	-1.4 (3.1)	-0.5%	(-6.4, 3.7)	0.657	-2.7 (1.9)	-0.9%	(-5.9, 0.4)	0.153
PY 2	286	287	320	308	2.5 (3.8)	0.9%	(-3.7, 8.6)	0.512	-2.3 (2.1)	-0.8%	(-5.8, 1.2)	0.277
PY 3	286	290	325	311	-2.0 (3.7)	-0.7%	(-8.1, 4.1)	0.591	-5.1** (2.2)	-1.7%	(-8.8, -1.4)	0.024
PY 4	244	250	277	266	-1.3 (3.7)	-0.5%	(-7.3, 4.8)	0.726	-8.3*** (2.3)	-3.3%	(-12.2, -4.5)	0.000
PY 1 through PY 4	276	279	308	295	-0.5 (3.0)	-0.2%	(-5.3, 4.4)	0.870	-4.7*** (1.8)	-1.7%	(-7.6, -1.7)	0.010
Outpatient ED visits, including observation stays												
Baseline	476	480	527	529	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	475	484	530	536	-0.9 (5.5)	-0.2%	(-10.0, 8.1)	0.864	-5.5* (3.0)	-1.1%	(-10.4, -0.6)	0.065
PY 2	468	479	523	526	-6.2 (6.2)	-1.3%	(-16.4, 3.9)	0.314	-8.0** (3.5)	-1.7%	(-13.8, -2.3)	0.021
PY 3	470	480	525	527	-6.7 (6.8)	-1.4%	(-17.9, 4.5)	0.326	-7.5** (3.6)	-1.6%	(-13.5, -1.5)	0.040
PY 4	361	378	413	424	-4.1 (7.7)	-1.1%	(-16.7, 8.5)	0.596	-14.3*** (4.5)	-3.8%	(-21.6, -6.9)	0.001
PY 1 through PY 4	442	454	497	502	-4.5 (5.6)	-1.0%	(-13.8, 4.7)	0.421	-9.0*** (3.2)	-2.0%	(-14.2, -3.7)	0.005
Total urgent care center (UCC) visits												
Baseline	114	112	95	104	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	132	127	108	116	0.6 (3.1)	0.5%	(-4.5, 5.7)	0.841	1.5 (2.3)	1.2%	(-2.2, 5.3)	0.496
PY 2	151	140	120	121	0.5 (3.8)	0.3%	(-5.8, 6.8)	0.901	6.5** (2.9)	4.5%	(1.8, 11.3)	0.024
PY 3	167	159	135	138	-0.2 (6.3)	-0.1%	(-10.5, 10.2)	0.979	3.7 (4.4)	2.2%	(-3.6, 10.9)	0.407
PY 4	172	148	144	131	0.5 (7.6)	0.3%	(-11.9, 13.0)	0.944	19.9*** (5.0)	13.1%	(11.7, 28.1)	0.000
PY 1 through PY 4	156	144	127	127	1.1[e] (4.3)	0.7%	(-6.1, 8.2)	0.808	7.6** (3.0)	5.1%	(2.6, 12.6)	0.012
Ambulatory primary care visits												
Baseline	4,207	4,341	4,538	4,507	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	4,260	4,439	4,614	4,611	-18.9 (27.9)	-0.4%	(-64.8, 27.0)	0.499	-46.5** (18.3)	-1.1%	(-76.6, -16.5)	0.011

Table 5.F.10 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
PY 2	4,298	4,435	4,589	4,588	27.1 (38.6)	0.6%	(-36.3, 90.6)	0.482	-3.8 (24.5)	-0.1%	(-44.2, 36.6)	0.877
PY 3	4,367	4,493	4,601	4,623	59.1 (44.0)	1.4%	(-13.2, 131.5)	0.179	5.0 (28.2)	0.1%	(-41.3, 51.3)	0.859
PY 4	3,933	4,070	4,227	4,194	-5.7 (52.1)	-0.1%	(-91.5, 80.1)	0.913	-5.5 (32.9)	-0.1%	(-59.6, 48.5)	0.867
PY 1 through PY 4	4,210	4,354	4,517	4,513	16.7 (35.4)	0.4%	(-41.6, 75.0)	0.638	-13.1 (23.1)	-0.3%	(-51.1, 25.0)	0.572
Proportion of ambulatory primary care visits that are non-face-to-face												
PY 4	0.16	0.16	0.20	0.19	-0.01 (0.01)	-3.4%	(-0.01, 0.00)	0.282	0.01** (0.00)	5.3%	(0.00, 0.01)	0.045
Unweighted sample sizes												
Number of practices	738	2,979	2,488	5,151								
Number of beneficiaries	748,240	2,886,363	1,389,753	3,555,059								
Number of beneficiary years[f]	2,492,554	9,570,503	4,542,500	11,667,078								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[e] We estimated the cumulative model using a triple difference specification with interactions with post instead of annual indicators. Because the post indicators were used for lower levels of the interaction (i.e., the interaction with whether the region was CPC+ or comparison, the interaction with whether the beneficiary was in practice that was a CPC+ or comparison practice, and time dummies), this means that the coefficient of the triple-interaction can be outside the bounds of the annual estimates. For the fifth annual report, we plan to adjust our strategy for calculating cumulative estimates so this cannot happen.

[f] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 39.2 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 18.2 percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 49.7 percent of the size of the actual comparison group. Because CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.8 percent of the actual sample size.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Table 5.F.10 *(continued)*

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; n.a. = not applicable; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

Table 5.F.11. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 1 non-SSP practices

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)												
Total Medicare Part A and B expenditures without additional payments												
Baseline	$855	$861	$909	$915	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$874	$871	$926	$928	$5.4 ($6.7)	0.6%	(-$5.7, $16.4)	0.426	$8.4 ($5.1)	1.0%	($0.0, $16.8)	0.101
PY 2	$925	$921	$970	$973	$7.4 ($7.3)	0.8%	(-$4.7, $19.4)	0.314	$7.7 ($5.3)	0.8%	(-$0.9, $16.4)	0.143
PY 3	$972	$965	$1,008	$1,009	$9.6 ($8.2)	1.0%	(-$3.9, $23.1)	0.241	$13.2** ($6.1)	1.4%	($3.1, $23.3)	0.031
PY 4	$926	$929	$975	$989	$12.2 ($9.2)	1.3%	(-$3.0, $27.3)	0.186	$11.0* ($6.4)	1.2%	($0.4, $21.5)	0.089
PY 1 through PY 4	$926	$924	$967	$974	$9.3 ($6.4)	1.0%	(-$1.1, $19.8)	0.143	$9.8** ($4.7)	1.1%	($2.0, $17.5)	0.038
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	289	288	318	306	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	289	286	316	304	1.0 (3.1)	0.3%	(-4.2, 6.2)	0.752	1.5 (2.4)	0.5%	(-2.5, 5.4)	0.538
PY 2	283	284	315	303	-2.0 (3.3)	-0.7%	(-7.5, 3.5)	0.546	-1.6 (2.5)	-0.6%	(-5.8, 2.6)	0.533
PY 3	283	282	308	297	1.3 (3.5)	0.5%	(-4.5, 7.1)	0.704	-0.1 (2.8)	0.0%	(-4.6, 4.5)	0.980
PY 4	242	244	272	264	2.6 (3.6)	1.1%	(-3.3, 8.5)	0.465	-1.0 (2.7)	-0.4%	(-5.4, 3.5)	0.720
PY 1 through PY 4	273	273	300	289	0.9 (2.9)	0.3%	(-3.8, 5.6)	0.762	-0.5 (2.2)	-0.2%	(-4.1, 3.2)	0.839
Outpatient ED visits, including observation stays												
Baseline	510	518	567	568	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	506	520	560	567	0.5 (4.8)	0.1%	(-7.4, 8.4)	0.918	-5.3 (3.5)	-1.0%	(-11.0, 0.4)	0.125
PY 2	502	517	560	568	0.4 (5.5)	0.1%	(-8.6, 9.5)	0.940	-6.5* (4.0)	-1.3%	(-13.1, 0.0)	0.099
PY 3	500	517	555	564	-1.5 (5.9)	-0.3%	(-11.2, 8.3)	0.806	-9.1** (4.5)	-1.8%	(-16.5, -1.8)	0.041
PY 4	393	410	444	451	-3.2 (6.6)	-0.8%	(-14.0, 7.6)	0.627	-6.8 (5.1)	-1.7%	(-15.1, 1.5)	0.179
PY 1 through PY 4	473	488	526	534	-0.8 (4.8)	-0.2%	(-8.7, 7.2)	0.871	-7.1** (3.6)	-1.5%	(-13.1, -1.2)	0.048
Total urgent care center (UCC) visits												
Baseline	93	109	90	92	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	105	121	99	105	1.1 (3.1)	1.0%	(-4.0, 6.1)	0.728	-0.8 (2.5)	-0.8%	(-5.0, 3.3)	0.745
PY 2	118	135	103	110	1.2 (4.9)	1.1%	(-6.8, 9.3)	0.799	-1.4 (4.4)	-1.2%	(-8.7, 5.9)	0.749
PY 3	131	145	113	120	6.3 (6.7)	5.1%	(-4.6, 17.3)	0.343	3.1 (6.2)	2.4%	(-7.2, 13.4)	0.618
PY 4	129	133	115	114	9.7 (8.6)	8.1%	(-4.5, 23.8)	0.260	20.7*** (7.9)	19.2%	(7.7, 33.7)	0.009
PY 1 through PY 4	122	134	107	112	5.0 (5.1)	4.3%	(-3.4, 13.5)	0.326	5.4 (4.7)	4.7%	(-2.3, 13.1)	0.247
Ambulatory primary care visits												
Baseline	4,305	4,404	4,637	4,767	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.F.11 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
PY 1	4,332	4,495	4,703	4,832	-63.8** (29.5)	-1.5%	(-112.3, -15.2)	0.031	-64.2*** (24.4)	-1.5%	(-104.3, -24.1)	0.008
PY 2	4,388	4,521	4,672	4,823	-11.5 (37.2)	-0.3%	(-72.7, 49.7)	0.758	-35.0 (29.7)	-0.8%	(-83.9, 13.8)	0.238
PY 3	4,456	4,558	4,666	4,840	42.6 (44.3)	1.0%	(-30.2, 115.5)	0.336	-5.8 (33.7)	-0.1%	(-61.3, 49.7)	0.863
PY 4	4,009	4,160	4,188	4,385	16.1 (54.1)	0.4%	(-72.9, 105.1)	0.766	-17.8 (42.4)	-0.4%	(-87.6, 51.9)	0.674
PY 1 through PY 4	4,290	4,426	4,578	4,740	-4.7 (36.2)	-0.1%	(-64.2, 54.8)	0.897	-30.4 (29.5)	-0.7%	(-79.0, 18.2)	0.304
Proportion of ambulatory primary care visits that are non-face-to-face												
PY 4	0.15	0.14	0.14	0.14	0.01* (0.01)	7.0%	(0.00, 0.02)	0.074	0.01*** (0.00)	10.6%	(0.01, 0.02)	0.003
Unweighted sample sizes												
Number of practices	635	2,264	5,849	15,505								
Number of beneficiaries	712,440	2,073,435	2,486,237	7,468,021								
Number of beneficiary years[e]	2,391,106	6,850,517	8,295,823	25,170,798								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the p-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[e] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 24.9 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 24.0 percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 43.0 percent of the size of the actual comparison group. Because CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.8 percent of the actual sample size.

Table 5.F.11 ***(continued)***

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; n.a. = not applicable; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

Table 5.F.12. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 2 SSP practices

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)												
Total Medicare Part A and B expenditures without additional payments												
Baseline	$896	$893	$970	$956	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$917	$913	$993	$982	$4.3 ($8.9)	0.5%	(-$10.4, $19.0)	0.628	$1.4 ($5.1)	0.2%	(-$7.0, $9.9)	0.780
PY 2	$967	$966	$1,054	$1,038	-$4.1 ($11.7)	-0.4%	(-$23.3, $15.1)	0.726	-$2.0 ($6.2)	-0.2%	(-$12.3, $8.2)	0.742
PY 3	$1,010	$1,015	$1,106	$1,099	-$1.1 ($11.0)	-0.1%	(-$19.2, $16.9)	0.917	-$7.5 ($7.2)	-0.7%	(-$19.3, $4.3)	0.295
PY 4	$950	$965	$1,021	$1,018	-$7.3 ($12.7)	-0.8%	(-$28.2, $13.6)	0.564	-$12.8 ($8.1)	-1.3%	(-$26.1, $0.6)	0.116
PY 1 through PY 4	$963	$968	$1,038	$1,031	-$0.8 ($8.7)	-0.1%	(-$15.2, $13.6)	0.927	-$5.9 ($5.6)	-0.6%	(-$15.1, $3.4)	0.296
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	300	291	339	309	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	301	293	340	311	0.1 (3.9)	0.0%	(-6.3, 6.4)	0.989	-0.4 (2.4)	-0.1%	(-4.3, 3.5)	0.872
PY 2	297	289	342	310	-2.0 (4.6)	-0.7%	(-9.6, 5.6)	0.662	0.1 (2.6)	0.0%	(-4.1, 4.3)	0.965
PY 3	297	290	342	315	0.3 (4.5)	0.1%	(-7.0, 7.7)	0.944	-1.9 (2.8)	-0.6%	(-6.4, 2.6)	0.489
PY 4	253	249	291	266	0.7 (4.3)	0.3%	(-6.4, 7.8)	0.868	-3.6 (3.0)	-1.4%	(-8.6, 1.4)	0.241
PY 1 through PY 4	286	279	325	297	0.2 (3.6)	0.1%	(-5.6, 6.0)	0.956	-1.6 (2.3)	-0.6%	(-5.4, 2.1)	0.474
Outpatient ED visits, including observation stays												
Baseline	479	475	545	542	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	471	476	542	546	-1.0 (7.2)	-0.2%	(-12.9, 10.8)	0.885	-9.2*** (3.4)	-1.9%	(-14.8, -3.5)	0.007
PY 2	469	472	538	533	-8.9 (8.5)	-1.9%	(-22.8, 5.1)	0.295	-8.0** (3.8)	-1.7%	(-14.3, -1.8)	0.034
PY 3	469	472	537	528	-12.9 (8.8)	-2.7%	(-27.4, 1.5)	0.142	-7.7* (4.4)	-1.6%	(-14.8, -0.5)	0.078
PY 4	362	375	425	434	-4.2 (8.3)	-1.2%	(-17.8, 9.4)	0.609	-19.3*** (5.1)	-5.1%	(-27.8, -10.9)	0.000
PY 1 through PY 4	440	447	510	511	-6.5 (7.1)	-1.5%	(-18.1, 5.1)	0.357	-11.1*** (3.6)	-2.5%	(-17.1, -5.2)	0.002

Table 5.F.12 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Total urgent care center (UCC) visits												
Baseline	99	104	89	98	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	115	117	104	111	1.3 (5.0)	1.2%	(-6.8, 9.5)	0.786	3.6 (3.8)	3.2%	(-2.6, 9.8)	0.344
PY 2	132	129	117	115	-0.8 (6.9)	-0.6%	(-12.2, 10.6)	0.903	8.0* (4.6)	6.5%	(0.5, 15.6)	0.080
PY 3	138	146	129	133	-2.8 (9.5)	-2.0%	(-18.4, 12.8)	0.766	-0.6 (6.1)	-0.4%	(-10.7, 9.5)	0.921
PY 4	137	138	125	125	-1.0 (9.2)	-0.7%	(-16.2, 14.2)	0.914	10.2* (6.1)	8.1%	(0.2, 20.1)	0.092
PY 1 through PY 4	131	133	119	121	-0.5 (6.3)	-0.4%	(-10.8, 9.7)	0.930	5.3 (4.5)	4.2%	(-2.2, 12.7)	0.246
Ambulatory primary care visits												
Baseline	4,214	4,355	4,494	4,525	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	4,237	4,424	4,553	4,635	4.4 (32.0)	0.1%	(-48.2, 57.0)	0.890	-47.2** (20.9)	-1.1%	(-81.6, -12.9)	0.024
PY 2	4,269	4,436	4,566	4,597	-26.4 (45.0)	-0.6%	(-100.5, 47.7)	0.558	-27.4 (28.6)	-0.6%	(-74.5, 19.7)	0.339
PY 3	4,335	4,492	4,592	4,625	-14.5 (56.7)	-0.3%	(-107.7, 78.7)	0.798	-18.5 (38.1)	-0.4%	(-81.2, 44.1)	0.626
PY 4	3,884	4,079	4,170	4,194	-61.4 (68.6)	-1.6%	(-174.2, 51.4)	0.371	1.9 (38.5)	0.0%	(-61.5, 65.2)	0.962
PY 1 through PY 4	4,175	4,352	4,482	4,526	-22.5 (43.2)	-0.5%	(-93.6, 48.5)	0.602	-21.0 (28.3)	-0.5%	(-67.6, 25.6)	0.459
Proportion of ambulatory primary care visits that are non-face-to-face												
PY 4	0.18	0.16	0.24	0.23	0.00 (0.01)	1.6%	(-0.01, 0.01)	0.689	0.02*** (0.01)	10.4%	(0.01, 0.03)	0.003
Unweighted sample sizes												
Number of practices	636	1,817	2,423	5,010								
Number of beneficiaries	794,661	2,091,381	1,313,786	3,440,620								
Number of beneficiary years[e]	2,637,835	6,963,367	4,268,869	11,298,382								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the p-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Table 5.F.12 *(continued)*

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[e] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 23.0 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 12.4 percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 38.0 percent of the size of the actual comparison group. Because CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.7 percent of the actual sample size.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; NA = not applicable; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

Table 5.F.13. Regression-adjusted means and estimated triple-differences and difference-in-differences impacts of CPC+ on selected outcomes for attributed Medicare FFS beneficiaries during the first four program years, Track 2 non-SSP practices

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)												
Total Medicare Part A and B expenditures without additional payments												
Baseline	$861	$865	$895	$906	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	$881	$877	$916	$925	$5.1 ($6.3)	0.6%	(-$5.2, $15.4)	0.415	$7.6 ($4.7)	0.9%	(-$0.2, $15.3)	0.108
PY 2	$937	$928	$966	$978	$13.3* ($7.4)	1.4%	($1.2, $25.4)	0.071	$10.5** ($5.2)	1.1%	($1.9, $19.1)	0.044
PY 3	$975	$977	$1,013	$1,024	$2.0 ($7.8)	0.2%	(-$10.9, $14.9)	0.796	$1.6 ($5.9)	0.2%	(-$8.1, $11.2)	0.788
PY 4	$931	$936	$984	$999	$4.0 ($8.6)	0.4%	(-$10.1, $18.1)	0.643	$7.5 ($6.2)	0.8%	(-$2.6, $17.6)	0.223
PY 1 through PY 4	$933	$932	$965	$978	$5.9 ($6.2)	0.6%	(-$4.2, $16.1)	0.337	$6.2 ($4.6)	0.7%	(-$1.3, $13.8)	0.176
Service use (per 1,000 beneficiaries per year)												
Acute hospitalizations (short-stay acute care and critical access hospitals)												
Baseline	287	286	304	305	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	285	285	304	305	-0.8 (2.8)	-0.3%	(-5.5, 3.9)	0.784	-0.7 (2.2)	-0.2%	(-4.3, 2.9)	0.745
PY 2	283	285	302	305	-0.8 (3.2)	-0.3%	(-6.0, 4.4)	0.798	-2.9 (2.3)	-1.0%	(-6.7, 1.0)	0.220
PY 3	279	285	301	304	-6.1* (3.3)	-2.1%	(-11.5, -0.7)	0.063	-7.5*** (2.5)	-2.6%	(-11.6, -3.4)	0.003
PY 4	238	243	266	269	-3.9 (3.2)	-1.6%	(-9.3, 1.4)	0.224	-5.2** (2.4)	-2.1%	(-9.2, -1.3)	0.030
PY 1 through PY 4	270	274	290	293	-3.1 (2.6)	-1.1%	(-7.4, 1.3)	0.243	-4.3** (2.0)	-1.6%	(-7.6, -1.0)	0.032
Outpatient ED visits, including observation stays												
Baseline	503	506	581	563	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	498	508	575	563	-0.7 (4.6)	-0.1%	(-8.4, 6.9)	0.876	-6.4** (3.2)	-1.3%	(-11.7, -1.1)	0.048
PY 2	496	505	574	561	0.3 (5.3)	0.1%	(-8.4, 9.1)	0.951	-5.3 (3.7)	-1.1%	(-11.4, 0.9)	0.159
PY 3	496	507	572	562	0.1 (5.9)	0.0%	(-9.6, 9.8)	0.985	-8.0* (4.3)	-1.6%	(-15.2, -0.9)	0.064
PY 4	390	398	457	452	9.3 (6.4)	2.5%	(-1.2, 19.9)	0.146	-1.3 (4.7)	-0.3%	(-9.1, 6.5)	0.788
PY 1 through PY 4	468	477	541	531	2.2 (4.9)	0.5%	(-5.8, 10.2)	0.650	-5.5 (3.5)	-1.2%	(-11.2, 0.3)	0.121
Total urgent care center (UCC) visits												
Baseline	96	107	99	90	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	108	119	106	101	2.0 (2.8)	1.9%	(-2.6, 6.7)	0.478	-1.1 (2.2)	-1.0%	(-4.7, 2.6)	0.640
PY 2	119	131	108	108	3.8 (4.4)	3.3%	(-3.4, 10.9)	0.391	-2.9 (3.8)	-2.4%	(-9.1, 3.3)	0.442
PY 3	131	145	119	121	3.9 (5.0)	3.0%	(-4.4, 12.1)	0.441	-4.0 (4.3)	-3.0%	(-11.1, 3.1)	0.356
PY 4	129	134	120	115	5.9 (6.0)	4.8%	(-4.0, 15.9)	0.325	7.9* (4.7)	6.5%	(0.1, 15.7)	0.097
PY 1 through PY 4	122	133	113	111	4.0 (4.0)	3.4%	(-2.7, 10.6)	0.325	0.1 (3.4)	0.1%	(-5.4, 5.6)	0.972

Table 5.F.13 *(continued)*

	Triple-differences regression-adjusted means				Triple-differences estimates				Difference-in-differences estimates with COVID controls			
	CPC+ mean[a]	Comparison mean[a]	Non-CPC+ mean[a]	Non-comparison mean[a]	Impact estimate[b] (SE)	Percentage impact[c]	90% confidence interval	*p*-value	Impact estimate[d] (SE)	Percentage impact[c]	90% confidence interval	*p*-value
Ambulatory primary care visits												
Baseline	4,476	4,505	4,678	4,777	NA	NA	NA	NA	NA	NA	NA	NA
PY 1	4,466	4,584	4,757	4,861	-83.7*** (29.6)	-1.8%	(-132.4, -35.0)	0.005	-90.0*** (24.0)	-2.0%	(-129.5, -50.6)	0.000
PY 2	4,500	4,583	4,699	4,815	-37.0 (38.5)	-0.8%	(-100.3, 26.2)	0.336	-59.2* (30.8)	-1.3%	(-109.9, -8.6)	0.054
PY 3	4,549	4,628	4,684	4,815	-17.9 (43.9)	-0.4%	(-90.2, 54.3)	0.683	-53.4 (35.0)	-1.2%	(-110.9, 4.1)	0.127
PY 4	4,084	4,179	4,219	4,363	-21.8 (51.3)	-0.5%	(-106.2, 62.6)	0.671	-41.2 (36.7)	-1.0%	(-101.5, 19.2)	0.262
PY 1 through PY 4	4,392	4,485	4,613	4,736	-40.4 (36.1)	-0.9%	(-99.8, 19.1)	0.264	-60.8** (28.5)	-1.4%	(-107.7, -14.0)	0.033
Proportion of ambulatory primary care visits that are non-face-to-face												
PY 4	0.16	0.15	0.24	0.23	0.01* (0.01)	5.5%	(0.00, 0.02)	0.100	0.02*** (0.00)	13.6%	(0.01, 0.03)	0.000
Unweighted sample sizes												
Number of practices	879	1,966	4,853	15,105								
Number of beneficiaries	984,426	2,104,338	1,944,931	7,299,554								
Number of beneficiary years[e]	3,307,198	6,960,054	6,409,365	24,593,260								

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the p-values, findings on related outcomes, and sensitivity tests.

[a] We report the actual, unadjusted CPC+ mean for each time period shown in the table. For comparison group practices, non-CPC+ practices, and non-comparison practices, we report the actual, unadjusted mean during the baseline period but the adjusted mean during each intervention period. We obtained the adjusted mean by subtracting the regression-adjusted difference between the CPC+ mean and each group's mean in each time period from the CPC+ mean in that same time period.

[b] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate except for the non-face-to-face percentage of ambulatory primary care visits outcome is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

Impact estimates for the non-face-to-face percentage of ambulatory primary care visits outcome reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices and non-comparison practices in 2020.

[c] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

[d] Difference-in-difference impact estimates are regression-adjusted using a difference-in-differences analysis that reflects the difference of the average outcome for Medicare FFS beneficiaries attributed to CPC+ practices in the first four years of CPC+ to the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries attributed to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and COVID-19 controls. Impact estimates for the proportion of ambulatory primary care visits that were not face-to-face reflect the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices and comparison practices in 2020.

[e] After accounting for weights that adjust for matching, time observed in Medicare FFS, and the concentration of CPC+ in each geographic area, the effective sample sizes are reduced. For non-CPC+ practices, the effective sample size (in terms of beneficiary-years) is 38.8 percent of the actual group size. For non-comparison practices, the effective sample size (in terms of beneficiary-years) is 18.1

Table 5.F.13 *(continued)*

percent of the actual group size. For the comparison group, the effective sample size (in terms of beneficiary-years) is 42.8 percent of the size of the actual comparison group. Because CPC+ sample size is affected only by time the beneficiary is observed (and is not affected by the matching weights), the effective sample size for the CPC+ group is about 95.7 percent of the actual sample size.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; NA = not applicable; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error.

C. Sensitivity tests of the triple-differences findings

The results from the sensitivity tests for the triple-differences model are generally aligned with the main triple-differences model, though in some cases the sensitivity tests estimates are even less favorable, particularly for Medicare expenditures where the main model showed no significant impacts. Tables 5.F.14 and 5.F.15 report the results from the sensitivity tests for the triple-differences models for the three key outcomes: (1) Medicare expenditures, (2) acute hospitalizations, and (3) outpatient ED visits. Our findings indicate:

- Including controls for the effects of COVID-19 did not substantially affect the triple-differences estimates in PY 4 in both tracks, suggesting that non-CPC+ and non-comparison practices reasonably capture the regional impacts of COVID-19 on CPC+ and comparison practices.
- When winsorizing the concentration weights at the 99th percentile, the triple-differences estimates were generally consistent with the estimates from the main triple-differences model.
  - The one exception was for Medicare expenditures in Track 1 practices, where the cumulative impact estimate was slightly higher at $7.9 per beneficiary per month (PBPM) (0.8%; $p < 0.10$).
- When we did not use concentration weights, impact estimates for acute hospitalizations and outpatient ED visits remained statistically insignificant in both tracks. However, for Medicare expenditures, excluding concentration weights resulted in a statistically significant increase of $11.3 PBPM in Track 1 and $11.4 PBPM in Track 2. These unfavorable estimates were larger in magnitude than the main triple-differences model.
- Estimates from the no-spillover model, which omits non-CPC+ and non-comparison practices that share a TIN with a CPC+ or comparison practice, are consistent with the main triple-differences estimates for acute hospitalizations and outpatient ED visits in both tracks. For Medicare expenditures, the results were also consistent across models for Track 2 practices. However, for Track 1, the no-spillover model resulted in a larger and statistically significant cumulative impact estimate of $12.3 PBPM. This suggests that spillover is not causing the triple-differences model to estimate less-favorable impacts than the difference-in-differences model.
- Estimates from the model restricting the sample to beneficiaries attributed in the first quarters of the baseline and intervention periods are consistent with those from the main triple-differences model for acute hospitalizations and outpatient ED visits in both tracks, and also for Medicare expenditures in Track 2. However, in Track 1, the restricted sample model estimated a statistically significant cumulative impact of $8.4 PBPM for Medicare expenditures.

Taken together, these results suggest that the impact estimates for both acute hospitalizations and outpatient ED visits were robust to varying the concentration weights and to alternative beneficiary or practice inclusion criteria. They also suggest that the magnitude of estimates for Medicare expenditures from the main triple-differences model was somewhat sensitive to excluding concentration weights from the analysis and changing to the sample of practices, especially in Track 1. However, while the magnitude of the impacts on expenditures varied, our sensitivity tests all suggest that CPC+ did not reduce Medicare expenditures.

Table 5.F.14. Triple-differences impact estimates of cumulative impact of CPC+ on selected outcomes for Track 1, from main analysis and sensitivity tests

	Medicare expenditures without enhanced payments (per beneficiary per month)				Acute hospitalizations (short-stay acute care and critical access hospitals) per 1,000 beneficiaries per year				Outpatients ED visits, including observation stays per 1,000 beneficiaries per year			
	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value
Main triple-differences estimates												
PY 1 through PY 4	$5.9 ($4.7)	0.6%	(-$1.8, $13.6)	0.207	0.1 (2.1)	0.0%	(-3.3, 3.5)	0.966	-2.8 (3.7)	-0.6%	(-9.0, 3.4)	0.456
Including COVID-19 controls in PY4												
PY 1 through PY 4	$6.1 ($4.7)	0.6%	(-$1.6, $13.8)	0.193	0.0 (2.1)	0.0%	(-3.4, 3.4)	0.999	-2.5 (3.7)	-0.5%	(-8.6, 3.7)	0.505
With winsorized concentration weights at the 99th percentile												
PY 1 through PY 4	$7.9* ($4.4)	0.8%	($0.6, $15.1)	0.074	0.8 (1.9)	0.3%	(-2.3, 4.0)	0.672	-2.2 (3.3)	-0.5%	(-7.7, 3.2)	0.501
Without concentration weight for non-CPC+ practices and non-comparison practices												
PY 1 through PY 4	$11.3*** ($3.7)	1.2%	($5.2, $17.5)	0.002	-1.0 (1.6)	-0.4%	(-3.6, 1.7)	0.548	-0.9 (2.8)	-0.2%	(-5.4, 3.6)	0.745
Excluding practices that share the same TIN as CPC+ or comparison practices												
PY 1 through PY 4	$12.3** $5.1)	1.3%	($3.9, $20.7)	0.016	2.5 (2.3)	0.9%	(-1.3, 6.2)	0.282	2.0 (4.1)	0.4%	(-4.7, 8.7)	0.625
Include only beneficiaries attributed in first quarter of baseline and intervention periods												
PY 1 through PY 4	$8.4* ($5.0)	0.9%	($0.2, $16.6)	0.093	1.4 (2.3)	0.5%	(-2.3, 5.1)	0.537	-2.1 (3.9)	-0.4%	(-8.5, 4.3)	0.586

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

[b] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC = hierarchical condition category; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error; TIN = Tax Identification Number.

Table 5.F.15. Triple-differences impact estimates of cumulative impact of CPC+ on selected outcomes for Track 2, from main analysis and sensitivity tests

	Medicare expenditures without enhanced payments (per beneficiary per month)				Acute hospitalizations (short-stay acute care and critical access hospitals) per 1,000 beneficiaries per year				Outpatients ED visits, including observation stays per 1,000 beneficiaries per year			
	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value	Cumulative impact estimate[a] (SE)	Cumulative percentage impact[b]	90% confidence interval	*p*-value
Main triple-differences estimates												
PY 1 through PY 4	$2.6 ($5.3)	0.3%	(-$6.1, $11.3)	0.622	-1.6 (2.2)	-0.6%	(-5.2, 2.0)	0.475	-1.6 (4.2)	-0.4%	(-8.5, 5.3)	0.698
Including COVID controls in PY 4												
PY 1 through PY 4	$2.5 ($5.3)	0.3%	(-$6.1, $11.2)	0.629	-1.6 (2.2)	-0.6%	(-5.2, 2.0)	0.471	-1.4 (4.2)	-0.3%	(-8.4, 5.5)	0.732
With winsorized concentration weights at the 99th percentile												
PY 1 through PY 4	$5.1 ($4.8)	0.5%	(-$2.8, $13.0)	0.286	-0.7 (2.0)	-0.3%	(-4.0, 2.5)	0.712	0.3 (3.6)	0.1%	(-5.6, 6.1)	0.937
Without concentration weight for non-CPC+ practices and non-comparison practices												
PY 1 through PY 4	$11.4*** ($4.2)	1.2%	($4.6, $18.3)	0.006	-1.1 (1.7)	-0.4%	(-3.9, 1.7)	0.525	-3.2 (2.9)	-0.7%	(-8.0, 1.6)	0.278
Excluding practices that share the same TIN as CPC+ or comparison practices												
PY 1 through PY 4	$7.3 ($5.9)	0.8%	(-$2.4, $16.9)	0.215	0.6 (2.3)	0.2%	(-3.2, 4.5)	0.784	4.4 (4.5)	1.0%	(-3.1, 11.9)	0.332
Include only beneficiaries attributed in first quarter of baseline and intervention periods												
PY 1 through PY 4	$7.1 ($5.4)	0.7%	(-$1.8, $15.9)	0.189	0.0 (2.3)	0.0%	(-3.9, 3.8)	0.989	-1.3 (4.2)	-0.3%	(-8.1, 5.6)	0.764

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, and sensitivity tests.

[a] Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics (including HCC scores) and practice fixed effects. Each impact estimate is based on a triple-differences analysis and reflects the difference between (1) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices, and (2) the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in non-CPC+ practices in the first four program years compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in non-comparison practices.

[b] We calculate percentage impacts relative to what the CPC+ mean would have been in each year in the absence of the intervention—that is, the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ED = emergency department; FFS = fee-for-service; HCC – hierarchical condition category; non-comparison = unselected practices in CPC+ comparison regions; non-CPC+ = non-participating practices in CPC+ regions; PY = Program Year; SE = standard error; TIN = Tax Identification Number.

5.F.5. Discussion

Overall, the triple-differences analysis found no statistically significant cumulative impacts of CPC+ on any of the key outcomes (i.e., Medicare expenditures, acute hospitalizations, and ED visits). Most of the yearly estimates were also statistically insignificant. In contrast to the difference-in-differences model that showed growing reductions in utilization outcomes (also statistically significant in later program years), the estimates from the triple-differences model showed more conservative impacts, with wider confidence intervals. However, in most cases, the two sets of estimates did not differ significantly from each other.

The results of the triple-differences model were generally robust to several sensitivity tests: the inclusion of COVID-19-related control variables, changes in concentration weights, exclusion of practices that are under common ownership with CPC+ or comparison practices, and limiting the sample to beneficiaries attributed only during the first quarter of the baseline and intervention periods. The only exceptions were for Medicare expenditures and were mainly in Track 1, where we found slightly more unfavorable and statistically significant estimates with the sensitivity tests. However, our main conclusion that CPC+ did not reduce Medicare expenditures remained unchanged.

Although the triple-differences model is more robust to the presence of differential regional shocks or trends between CPC+ and comparison regions, the estimates from this model should still be interpreted in the context of the triple-differences model's limitations. For example, the triple-differences model nets out any potential positive spillovers (for example, knowledge of practice transformation) that could flow from CPC+ to non-CPC+ practices within the region, and thus omits a portion of CPC+'s potential impacts. Second, the triple-differences model estimates are generally less precise, which makes it less likely that the model would accurately detect small, yet policy relevant, program impacts. Third, when estimating the impacts of CPC+ across four program years, two tracks, and two SSP subgroups, the number of individual impact estimates becomes large enough that statistically significant impact estimates may occur purely by chance, leading to disagreements between the difference-in-differences and triple-differences models' estimates. This is why we take a fairly conservative approach and when the difference-in-differences estimate falls within the 90 percent confidence interval of the triple-differences estimate, we determine that the findings from the two models are aligned and are not substantially different from each other.

Taken together, the triple-differences model and the difference-in-differences model both suggest that there were no greater than 3 percent effects on Medicare FFS beneficiaries' outcomes over the first four years of CPC+.

5.G. Participation in other initiatives

In this Appendix, we quantify how participation in other initiatives differs between CPC+ and comparison practices and how this participation shifted from the baseline period to the first four program years (PYs) of CPC+ for both research groups.

CPC+ is taking place at the same time as many other initiatives that aim to improve the quality and value of medical care. CPC+ practices are allowed to participate in some, but not all, of these initiatives; therefore, we expect comparison practices to participate in some initiatives—such as billing for chronic care management (CCM) services—at higher rates than the CPC+ practices. Higher participation rates among comparison practices than among CPC+ practices will not bias our main impact estimates, because we assume that the comparison practices represent the accurate counterfactual for CPC+ practices had CPC+ not existed (that is, CPC+ practices might have participated in other initiatives at higher rates had CPC+ not existed). At the same time, differences in participation could potentially lead to smaller overall effects of CPC+ than we would observe if some or all of the other initiatives did not exist. This weakening of effects would occur if the other initiatives duplicate some of the incentives and supports provided through CPC+ and these incentives and supports lead to better outcomes. Since the primary concern is whether participation in other initiatives changed differentially for CPC+ and comparison practices between the baseline and intervention periods, we used a difference-in-differences strategy, when possible, to examine changes in participation over time between the two groups.

We analyzed participation in four broad types of CMS initiatives that we were able to measure participation in through PY 4: (1) care management services, (2) value-based purchasing models, (3) primary care transformation initiatives, and (4) bundled payment initiatives. In Table 5.G.1, we list the specific initiatives we report results for within these four broad types, the data source, the definition of a beneficiary being exposed to the initiative, and whether CPC+ practices (or their CMS-attributed Medicare fee-for-service [FFS] beneficiaries[111]) could participate in these initiatives during the periods we study. In addition to initiatives listed in the table, we explored participation in the following initiatives: Community-Based Care Transition, Comprehensive Joint Replacement, Oncology Care Model, Independence at Home, Financial Alignment Initiative Demonstration for Medicare-Medicaid Enrollees, Comprehensive ESRD Care, Psychiatric Collaborative Care Management, and General Behavioral Health Integration. We did not include results for these initiatives because participation rates were less than 1 percent in all cases, so there was little potential either for interaction effects with CPC+ or for potentially confounding the impacts of CPC+.

We excluded five initiatives from this Appendix due to data limitations. In Appendix 5.E of the third CPC+ annual evaluation report (Orzol et al. 2021), we used data from the CPC+ practice survey to examine CPC+ and comparison practices' participation in five additional primary care

[111] We report whether CMS-attributed Medicare FFS beneficiaries could participate in the initiative to provide context on the level of participation expected for the CPC+ group. However, later we measure participation using the intent-to-treat evaluation sample of beneficiaries to ensure comparability between the CPC+ and comparison groups.

transformation or insurer-sponsored initiatives: State Innovation Models, Medicaid Health Homes, Health Care Innovation Awards, state or community-based Quality Improvement initiatives, and insurer-sponsored initiatives that link payment to performance or value. Starting with PY 4, however, the practice survey no longer included comparison practices in the sample. Consequently, we were unable to calculate the differential participation rates between the CPC+ and comparison practices for these five initiatives and we excluded them from this Appendix. Please refer to Orzol et al. (2021) for analyses with these initiatives through PY 3.

Table 5.G.1. Potential participation and our sample definition for participation in other initiatives

Type of initiative	Name of initiatives	Could active CPC+ practices or their CMS-attributed Medicare beneficiaries participate…		Data source	Definition of a beneficiary being exposed to the initiative
		During baseline period?	During intervention period?		
Medicare FFS Care Management Charges	Chronic Care Management	Yes	No	Medicare FFS physician and outpatient claims	Beneficiary's physician billed at least one of these care management services in the year
	Transitional Care Management	Yes	Yes		
	Other care management[a]	Yes	Yes		
Other Medicare FFS value-based purchasing models	Medicare Shared Savings Program	Yes	Yes	CMS Master Data Management System	Beneficiary's assigned practice was in the initiative in the year,[b] or beneficiary was attributed to the initiative in the year
	Next Generation (Next Gen) ACO	No[c]	No[c]		
Other primary care transformation initiatives	Accountable Health Communities	No	Yes	CMS rosters	Beneficiary was attributed to the initiative in the year
	Transforming Clinical Practice Initiative	Yes	No	CMS rosters	Beneficiary's assigned practice was in the initiative during the year[b]
Bundled Payment Initiatives	Bundled Payment for Care Improvement	Yes	Yes	Non-claims-based payment file[e]	Beneficiary had at least one payment for a covered service in the year
	Bundled Payment for Care Improvement Advanced	No	Yes		

Notes: In addition to initiatives listed above, we explored participation in the following initiatives: Community-Based Care Transition, Comprehensive Joint Replacement, Oncology Care Model, Independence at Home, Financial Alignment Initiative Demonstration for Medicare-Medicaid Enrollees, Comprehensive ESRD Care, Psychiatric Collaborative Care Management, and General Behavioral Health Integration. We did not include results for these initiatives because participation rates were less than 1 percent in all cases, so there was little potential either for interaction effects with CPC+ or for potentially confounding the impacts of CPC+.

[a] This includes the following types of procedure codes: physician supervision of a Home Health Agency patient, where the patient is not present; physician supervision of hospice patient, where the patient is not present; Psychiatric Collaborative Care Management; cognitive and functional assessment for a patient with cognitive impairment; General Care Management Services for use by RHCs and FQHCs; Psychiatric Collaborative Care Management for use by RHCs and FQHCs; and advance care planning.

[b] We define a practice as being in the initiative if any of its practitioners were in the initiative.

[c] To be consistent with baseline matching, where SSP and Next Gen participation were defined as participating as of January 1, 2017, we define baseline participation for SSP and Next Gen as participating as of January 1, 2017, for CPC+ PY 1 as participating as of January 1, 2018, for CPC+ PY 2 as participating as of January 1, 2019, for CPC+ PY 3 as participating as of January 1, 2020, and for CPC+ PY 4 as participating as of January 1, 2021. CMS did not permit active CPC+ practices to participate in Next Gen as of January 1, 2017.

Table 5.G.1 *(continued)*

[d] When this report was written, the non-claims-based payment file had a complete set of payments for episodes through the first three program years of CPC+ but not for the fourth program year.

ACO = Accountable Care Organization; CMS = Centers for Medicare & Medicaid Services; ESRD = end-stage renal disease; FFS = fee-for-service; FQHC = Federally Qualified Health Center; PY = Program Year; RHC = Rural Health Clinic; SSP = Medicare Shared Savings Program.

In the rest of this Appendix, we present the key takeaways of the results (Section 1), describe the methods used (Section 2), and discuss the results in greater detail for CPC+ practices and their matched comparison practices (Section 3). We then discuss the implications of the results for the impact analyses (Section 4) and preview upcoming initiatives that we plan to track in future reports (Section 5).

5.G.1. Key takeaways

- In each of the first four program years, both CPC+ and comparison practices continued to have high participation in the Medicare Shared Savings Program (SSP)—around 50 percent.
- In all other initiatives, participation was low (each less than 15 percent).
- For most initiatives, in each of the first four program years, changes in participation of CPC+ practices were similar to those of comparison practices, which suggests that differential contamination of initiatives between the CPC+ and comparison groups is unlikely to influence the impact estimates.
- In SSP, changes in participation of CPC+ practices differed substantially from those of comparison practices. Reflecting how the evaluation selected comparison practices, CPC+ and comparison practices had less than a 1 percentage point difference in SSP participation at baseline. However, the comparison practices were more likely to participate in SSP than the CPC+ practices by PY 4 (by 12.3 percentage points in Track 1 and 6.3 percentage points in Track 2). This was driven by comparison practices increasing their participation in SSP and, in the case of Track 1, CPC+ practices decreasing their participation. Most of these changes happened in prior years, and in fact, the gap in participation decreased by 1.3 percentage points for Track 1 and 3.1 percentage points for Track 2 from PY 3 to PY 4.
  - These results suggest that more CPC+ practices might have chosen to participate in SSP (which is an established CMS program) if CPC+ did not exist.
  - If SSP encourages types of changes in the comparison group similar to those occurring in the CPC+ group, and the changes improve outcomes, we may observe only small effects of CPC+ or none at all, even if the broader model of care transformation is indeed effective in improving quality or lowering costs. As a result of these findings, we have added a sensitivity analysis to the impact modeling in which we control for contemporaneous SSP participation.
  - The findings from the impact analysis for the SSP subgroup, which is defined based on SSP status at baseline only, should be interpreted with caution, because some practices in CPC+ and in the comparison group started or stopped participating in SSP after CPC+ began. Instead of interpreting the SSP subgroup results as the impact of CPC+ combined with SSP throughout the intervention period, they should be interpreted as the impact of *starting* CPC+ while participating in SSP.
- Participation was less than 1 percent in the baseline period and the first four program years among the CPC+ and comparison practices in both tracks for: Community-Based Care Transition, Comprehensive Joint Replacement, Oncology Care Model, Independence at Home, Financial Alignment Initiative Demonstration for Medicare-Medicaid Enrollees,

Comprehensive ESRD Care, Psychiatric Collaborative Care Management, and General Behavioral Health Integration.

Below we describe additional key findings for CPC+ practices and their matched comparison practices over the first four program years for each type of initiative.

A. Medicare FFS care management charges

- Both CPC+ and comparison practices billed any type of Medicare FFS care management codes for fewer than 15 percent of patients and had similar, small increases from baseline to the first four program years of CPC+ (1 to 4 percentage points for CPC+ practices and 2 to 5 percentage points for comparison practices, depending on track and program year).[112]
  - Both CPC+ practices and comparison practices billed a slightly higher proportion of high-risk patients for care management services than for all patients, but both sets of practices still had small and similar changes over time.

B. Other Medicare FFS value-based purchasing models

- Comparison practices increased their participation in Medicare FFS value-based purchasing models during the intervention period by 3 to 12 percentage points (depending on initiative, track, and program year), while CPC+ practices either decreased their participation, or increased their participation by less than the comparison group depending on the track and specific initiative. Difference-in-differences estimates ranged from -2 to -13 percentage points, depending on the initiative, program year, and track.

C. Other primary care initiatives

- Medicare FFS beneficiaries in CPC+ and comparison practices had participation less than 2 percent in Accountable Health Communities (AHCs) in PY 2 (the first year of the model that beneficiaries were attributed) through PY 4.
- Reflecting CPC+ eligibility rules, CPC+ practices had much lower participation (4 to 10 percentage points lower) in the Transforming Clinical Practice Initiative (TCPI) relative to the comparison group in PY 2 and PY 3 (the last performance year of TCPI).[113] The performance period for TCPI ended in 2019.

[112] Note that CPC+ practices were unable to bill for chronic care management codes during the model period for previously attributed patients, though they were able to bill transitional care management codes and other care management codes.

[113] Although CPC+ practices were technically unable to participate in TCPI during the CPC+ model period, we found low but non-zero participation rates among CPC+ practices (2.6 and 2.7 percent for Track 1 in PYs 2 and 3 and 2 percent for Track 2 in PYs 2 and 3) which may be explained by belated withdrawals, differences between the IQVIA and CMS practitioner rosters, or the intent-to-treat approach, which continues to follow practices that no longer participate in CPC+.

D. Bundled payment initiatives

- Medicare FFS beneficiaries in CPC+ practices had less than 2 percent participation in Bundled Payment for Care Improvement (BPCI) at baseline, and their participation decreased further during the model period through PY 2 (the last performance year of BPCI). The comparison group had participation rates and changes similar to those of CPC+ beneficiaries.
- Medicare FFS beneficiaries in CPC+ practices had 1 percent or less participation in BPCI Advanced in PY 2 (the first year of the model). Participation increased by less than 1 percentage point through PY 3 (the most recent year of available data). The comparison group had participation rates and changes similar to those of CPC+ beneficiaries.

5.G.2. Methods

A. Measuring participation in each initiative

Overview. Although CMS provides initiatives at the practice, practitioner, and beneficiary levels, we report participation in all initiatives as the percentage of beneficiaries in each group—CPC+ and comparison—who are exposed to that initiative, separately for Track 1 and Track 2 practices. We chose to measure participation as the percentage of beneficiaries who participated because our impact estimates are at the beneficiary level. To the extent that participation in other initiatives affected the impact findings, this would likely depend on the number of beneficiaries affected by such participation. Also, reporting participation at the beneficiary level for all initiatives enables us to keep the measurements consistent across initiatives in this participation analysis.[114]

Beneficiary-level initiatives. We measured provision of Medicare FFS care management services as the percentage of beneficiaries whose practitioner billed for at least one of those services in that year. We also looked at participation in Medicare FFS care management services for high-risk beneficiaries, defined as beneficiaries who had a hierarchical condition category (HCC) score greater than the 90th percentile of the distribution of HCC scores among assigned beneficiaries within their track or had Alzheimer's disease or dementia (indicated by the Chronic Conditions Warehouse) in 2015 for baseline and 2016 for intervention periods, because care management services are targeted to high-risk beneficiaries. We measured participation in AHC as the percentage of beneficiaries who were attributed to organizations participating in AHC based on CMS beneficiary rosters. We measured participation in BPCI and BPCI Advanced as the percentage of beneficiaries who were included in the non-claims-based payment file for BPCI and BPCI Advanced episodes.

Practitioner-level initiatives. Since Medicare FFS value-based purchasing models and TCPI report practitioners' participation in the initiatives, as opposed to practice sites participating, we

[114] For some initiatives, like CCM, participation is inherently at the beneficiary level, since billing for CCM services occurs on a per-beneficiary basis. However, for other initiatives, like TCPI, Next Gen, and SSP, practices decide whether or not to participate, and we assume that all beneficiaries assigned to participating practices were affected. Also, we selected comparison practices based on baseline initiative participation in SSP weighted at the beneficiary level. Therefore, we assess the balance in CPC+ and comparison practices' SSP participation at that level.

first used the IQVIA practitioner roster to roll practitioner participation up to the practice site level by counting a practice as participating if any practitioner in the practice was reported as participating.[115] We then weighted practice participation by the number of Medicare beneficiaries assigned to that practice in the baseline so we can interpret the results as the number of beneficiaries who were participating in the initiative.[116] Inferring beneficiary participation from practitioner participation tends to inflate participation because a practice and all of its assigned beneficiaries are determined to be participating in the model as long as the practice had at least one participating practitioner.[117] As a robustness check, we also used the beneficiary-level master data management (MDM) system to directly measure beneficiary participation (rather than inferring beneficiary participation from practitioner-level participation) in Medicare FFS value-based purchasing models.

We measured participation in Medicare FFS value-based purchasing models for each program year as of January 1 of the following calendar year, which is consistent with how we defined SSP participation at baseline for the main impacts, which was as of January 1, 2017. For example, PY 1 SSP and Next Gen participation was defined as of January 1, 2018. For all other initiatives, we measured participation in the respective program year.

B. Analytic approach

Overview. To estimate difference-in-differences changes in participation in each initiative, comparing the CPC+ and comparison practices from the baseline year through PY 4 of CPC+, we used a regression model similar to the one used for all claims-based beneficiary-level outcomes described in this report (see Chapter 5 in Swankoski et al. 2022), but we did not include any additional regression covariates other than the difference-in-differences estimators. We did not include additional controls since the goal of the analysis was to understand the total, non-adjusted participation in initiatives.

Level of regressions. For the initiatives that had observations at the beneficiary level (that is, Medicare FFS care management, BPCI, BPCI Advanced, and the Medicare FFS value-based purchasing models based on the beneficiary MDM), regressions were at the beneficiary level, and we used beneficiary-level matching weights. For all initiatives for which we rolled up participation to the practice level (that is, TCPI and the Medicare FFS value-based purchasing models based on the practitioner MDM), regressions were run at the practice level; however, because we used practice-level matching weights that weight practices by the number of

[115] The MDM reports 90 percent of participation in SSP at the Tax Identification Number (TIN) level, and 10 percent at the NPI/TIN level. Since TINs are not unique at the practice level, we merged measures of participation of all practitioners to whom we assigned that TIN, and then rolled up participation to the practice level using the IQVIA practitioner roster.

[116] This is the same method that we used for comparison selection. That is, we first looked at practitioner-level participation in SSP or other initiatives and then rolled these measures up to the practice level. Then, we weighted by the number of beneficiaries in the practice in the baseline year.

[117] That is, practices in which some or all of the practitioners participated in a Medicare FFS value-based purchasing model would equally be considered as participating in the model.

beneficiaries in that practice during the baseline period, the results can be interpreted as the number of beneficiaries who were participating in the initiative.

Initiatives with incomplete data. For AHC and BPCI Advanced, we present the participation rates and the percentage point differences in each program year, but not the difference-in-differences changes because the initiatives were not present at baseline. For BPCI, we present data through PY 2 because it ended in 2018; for BPCI Advanced, we present data through PY 3 because data for PY 4 were incomplete; for TCPI, we present data through PY 3 because it ended in 2019.

5.G.3. Results over the first four program years

Tables 5.G.2 and 5.G.3 report participation of beneficiaries in various initiatives by time period (baseline year and PY 1 through PY 4) for CPC+ practices and their comparison practices for Tracks 1 and 2, respectively. In these tables, dashes indicate a year in which we did not have data or in which the initiative was not active. For example, initiatives that ended prior to PY 4 have a dash in all cells corresponding to PY 4.

Figure 5.G.1 highlights the findings by plotting CPC+ and comparison group baseline period participation in initiatives for Track 1 and Track 2 practices, as well as the difference-in-differences estimates and 90 percent confidence intervals for PY 1 through PY 4 for initiatives with baseline data. For initiatives without baseline data, we plot the differences between CPC+ and comparison group in each program year.

Table 5.G.2. Participation in other initiatives by beneficiaries in CPC+ practices and comparison practices in the baseline and first four program years, Track 1

Total beneficiary participation in CMS initiatives was high for SSP, but less than 15 percent for all other initiatives. Comparison practices had participation similar to that of CPC+ practices over time, except for SSP and TCPI, for which participation grew by at least 5 percentage points more among comparison practices than among CPC+ practices in certain program years.

	Time period	Percentage of Medicare FFS beneficiaries exposed to the initiative		Percentage point difference	Percentage point difference-in-differences estimate (90% CI)
		CPC+ group	Comparison group		
Type of initiative: Medicare FFS Care Management Charges					
Name of initiative					
Chronic Care Management (all beneficiaries)	Base	1.1	1.6	-0.5	n.a
	PY 1	0.7	2.7	-2.0	-1.5*** (-1.8, -1.2)
	PY 2	1.1	2.9	-1.8	-1.4*** (-1.7, -1.1)
	PY 3	1.3	3.3	-2.0	-1.5*** (-1.8, -1.2)
	PY 4	1.8	4.1	-2.3	-1.8*** (-2.2, -1.4)
Chronic Care Management (high-risk beneficiaries[a])	Base	2.2	2.9	-0.8	n.a.
	PY 1	1.6	4.9	-3.2	-2.5*** (-3.0, -2.0)
	PY 2	2.6	5.8	-3.2	-2.5*** (-3.0, -2.0)
	PY 3	3.2	6.8	-3.6	-2.8*** (-3.3, -2.3)
	PY 4	4.4	8.4	-4.0	-3.2*** (-3.9, -2.5)
Transitional Care Management (all beneficiaries)	Base	3.7	3.4	0.3	n.a.
	PY 1	4.6	3.8	0.8	0.5*** (0.4, 0.7)
	PY 2	5.4	4.2	1.2	0.9*** (0.6, 1.1)
	PY 3	5.7	4.7	1.1	0.8*** (0.5, 1.0)
	PY 4	4.4	3.9	0.5	0.2 (-0.1, 0.4)
Transitional Care Management (high-risk beneficiaries[a])	Base	8.7	7.6	1.0	n.a.
	PY 1	10.6	8.8	1.8	0.7*** (0.3, 1.1)
	PY 2	11.4	9.1	2.3	1.3*** (0.7, 1.8)
	PY 3	12.1	9.9	2.3	1.2*** (0.6, 1.8)
	PY 4	9.3	8.3	1.0	0.0 (-0.6, 0.6)
Other care management[b] (all beneficiaries)	Base	2.9	2.0	0.9	n.a.
	PY 1	3.7	3.2	0.4	-0.5* (-0.9, 0.0)
	PY 2	4.1	4.1	0.0	-0.8*** (-1.4, -0.3)
	PY 3	4.8	5.1	-0.3	-1.2*** (-1.7, -0.6)
	PY 4	5.1	5.3	-0.2	-1.1*** (-1.7, -0.5)
Other care management[b] (high-risk beneficiaries[a])	Base	4.4	3.8	0.6	n.a.
	PY 1	6.0	6.0	0.0	-0.6** (-1.1, -0.1)
	PY 2	7.2	7.5	-0.3	-0.9** (-1.5, -0.3)
	PY 3	8.9	9.5	-0.5	-1.1*** (-1.8, -0.4)
	PY 4	9.4	9.9	-0.5	-1.1*** (-1.8, -0.4)
Combined measure of care management services					
Any care management[c] (all beneficiaries)	Base	7.2	6.4	0.8	n.a.
	PY 1	8.5	8.7	-0.2	-1.0*** (-1.5, -0.5)
	PY 2	9.8	9.9	-0.1	-0.9** (-1.5, -0.3)
	PY 3	10.9	11.4	-0.6	-1.3*** (-2.0, -0.7)
	PY 4	10.2	11.5	-1.3	-2.1*** (-2.8, -1.4)
Any care management[c] (high-risk beneficiaries[a])	Base	14.0	13.1	1.0	n.a.
	PY 1	16.7	17.2	-0.5	-1.5*** (-2.1, -0.8)
	PY 2	19.0	19.2	-0.1	-1.1** (-2.0, -0.3)
	PY 3	21.3	21.7	-0.4	-1.3** (-2.2, -0.5)
	PY 4	19.9	21.8	-1.8	-2.8*** (-3.7, -1.9)

Table 5.G.2 *(continued)*

	Time period	Percentage of Medicare FFS beneficiaries exposed to the initiative: CPC+ group	Percentage of Medicare FFS beneficiaries exposed to the initiative: Comparison group	Percentage point difference	Percentage point difference-in-differences estimate (90% CI)
Type of initiative: Other Medicare FFS value-based purchasing models[d]					
Name of initiative					
Medicare Shared Savings Program Practitioner-level MDM[d,e]	Base	51.4	52.3	-0.9	n.a.
	PY 1	53.2	58.7	-5.5	-4.6*** (-7.5, -1.7)
	PY 2	48.7	55.8	-7.1	-6.1*** (-9.7, -2.6)
	PY 3	45.1	58.7	-13.6	-12.7*** (-16.6, -8.8)
	PY 4	45.2	57.5	-12.3	-11.4*** (-15.4, -7.3)
Medicare Shared Savings Program Beneficiary-level MDM[d,f]	Base	48.8	44.2	4.7	n.a.
	PY 1	51.5	50.1	1.4	-3.2** (-5.6, -0.8)
	PY 2	46.1	46.5	-0.4	-5.0*** (-7.9, -2.2)
	PY 3	44.5	50.9	-6.4	-11.0*** (-14.2, -7.9)
	PY 4	43.4	48.5	-5.1	-9.8*** (-13.0, -6.6)
Next Generation Practitioner-level MDM[d,g]	Base	0.0	0.0	0.0	n.a.
	PY 1	0.2	3.2	-3.0	-3.0*** (-3.7, -2.2)
	PY 2	0.5	4.4	-3.9	-3.9*** (-5.1, -2.6)
	PY 3	0.2	3.9	-3.7	-3.7*** (-5.0, -2.5)
	PY 4	1.2	3.3	-2.2	-2.2*** (-3.4, -0.9)
Next Generation Beneficiary-level MDM[d,f]	Base	0.0	0.0	0.0	n.a.
	PY 1	0.3	3.0	-2.8	-2.8*** (-3.4, -2.2)
	PY 2	0.4	3.9	-3.6	-3.6*** (-4.4, -2.7)
	PY 3	0.4	3.5	-3.2	-3.2*** (-4.0, -2.3)
	PY 4	1.1	3.1	-2.1	-2.1*** (-3.0, -1.2)
Type of initiative: Other primary care transformation initiatives					
Name of initiative					
Accountable Health Communities	Base	-	-	-	-
	PY 1	-	-	-	-
	PY 2	0.1	0.3	-0.2	n.a.
	PY 3	0.6	0.8	-0.2	n.a.
	PY 4	1.1	1.0	0.1	n.a.
Transforming Clinical Practice Initiative[h]	Base	10.9	10.8	0.1	n.a.
	PY 1	10.3	12.2	-1.8	-2.0** (-3.6, -0.3)
	PY 2	2.6	10.5	-7.9	-8.0*** (-10.5, -5.5)
	PY 3	2.7	7.0	-4.4	-4.5*** (-7.3, -1.6)
	PY 4	-	-	-	-
Type of initiative: Bundled payment initiatives					
Name of initiative					
Bundled Payment for Care Improvement[i]	Base	1.6	1.7	-0.1	n.a.
	PY 1	1.3	1.4	-0.1	0.0 (-0.1, 0.0)
	PY 2	0.9	0.9	-0.1	0.0 (-0.1, 0.1)
	PY 3	-	-	-	-
	PY 4	-	-	-	-
Bundled Payment for Care Improvement – Advanced[j]	Base	-	-	-	-
	PY 1	-	-	-	-
	PY 2	1.0	0.8	0.2	n.a.
	PY 3	1.8	1.4	0.4	n.a.
	PY 4	-	-	-	-

Source: Analysis of Medicare FFS claims for 2016 through 2020; MDM extracts from January 27, 2017, February 23, 2018, February 26, 2019, February 28, 2020, and February 25, 2021; CMS January 2017, 2018, 2019, and 2020 TCPI rosters; CMS 2021 AHC roster, and the non-claims-based payment extract, which had payments up to January 2021.

Table 5.G.2 *(continued)*

Notes: We report participation in initiatives as the percentage of beneficiaries who were exposed to the initiative in each period in each group (Track 1 CPC+ or comparison practices), with comparison practices weighted using matching weights. Initiatives that are not at the beneficiary level are weighted by the number of beneficiaries assigned to that practice during the baseline period, so that the results can also be interpreted as the percentage of beneficiaries who were participating in the initiative. We calculated the difference in participation in a given year between Track 1 CPC+ and comparison practices as the percentage point difference. We calculated the difference-in-differences estimate as the difference in percentage participation between CPC+ and comparison practices in the relevant program period (PY 1 through PY 4), minus the difference in the baseline period. The difference-in-differences estimate is in percentage point units. We estimated 90 percent confidence intervals calculating standard errors using linear regression and clustering at the practice level. Dashes (-) indicate that participation or difference values are not available, due to limitations of the data source. n.a. indicates that the difference-in-differences estimate is not applicable, because we do not have data for the baseline period. 0.0 indicates that <0.05 percent of beneficiaries participated in the initiative. Note that the percentage point difference and the percentage point difference-in-differences estimates shown may differ from the corresponding calculations based on the percentages in the cells due to rounding. For Medicare FFS Care Management Charge initiatives, the population we used to calculate participation is indicated under the name of the initiative in parentheses. For the rest of the initiatives, we used the full population.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[a] We defined high-risk beneficiaries as those who had an HCC score greater than the 90th percentile of the distribution of HCC scores among assigned beneficiaries within their track or had Alzheimer's disease or dementia as indicated by the Chronic Conditions Warehouse. For baseline, we calculated HCC scores from 2015 claims. For the intervention period, we calculate HCC scores from 2016 claims.

[b] This includes CPT codes G0181 (physician supervision of a Home Health Agency patient, patient not present), G0182 (physician supervision of hospice patient, patient not present), G0502-G0504 and 99492-99494 (Collaborative Care Model), G0505 and 99483 (cognitive and function assessment for patient with cognitive impairment), G0511 (General Care Management Services for use by RHCs and FQHCs), G0512 (psychiatric collaborative care model for use by RHCs and FQHCs), 99497 (advance care planning), and G2064-G2065 (Principal Care Management Services). These codes capture some type of care management but are not chronic care management or transitional care management codes.

[c] This includes beneficiaries whose physicians billed at least one chronic care management, transitional care management, or other care management service.

[d] The date used to define whether a practice participated in SSP and Next Gen at baseline was January 1, 2017 (consistent with the date used to define participation in comparison group selection). Accordingly, we defined the PY 1 participation value as participation as of January 1, 2018, the PY 2 participation value as participation as of January 1, 2019, the PY 3 participation value as participation as of January 1, 2020, and the PY 4 participation value as participation as of January 1, 2021.

[e] In the practitioner MDM, 91 percent of participation in SSP is counted at the TIN level, while the remaining 9 percent is at the NPI-TIN level. If an NPI was listed in the practitioner MDM, we counted all practices with an NPI-TIN listed in that year as participating in SSP. If the NPI was missing in the practitioner MDM, we counted all practices with the TIN listed in that year as participating in SSP.

[f] In the beneficiary MDM, participation is at the beneficiary level and we measured participation as the fraction of beneficiaries in each sample (i.e., CPC+ and comparison group practices) who participated in the initiative. Because inferring beneficiary participation from practitioner participation tends to inflate participation, we separately measured participation based on the beneficiary MDM as a robustness check for the measure of participation based on the practitioner MDM.

[g] In the practitioner MDM, participation in Next Gen is at the NPI-TIN level. We counted all practices with an NPI-TIN listed in that year as participating in Next Gen.

[h] CPC+ practices were technically unable to participate in TCPI during the CPC+ intervention period; however, we found that 10.3 percent of CPC+ practices did not withdraw from TCPI before the beginning of 2017. This is likely because the practices did not immediately initiate withdrawal. For PY 2 and PY 3, we also found lower but non-zero participation rates among CPC+ practices (2.6 and 2.7 percent), which may be explained by additional belated withdrawals, differences between the IQVIA and CMS practitioner rosters, or the intent-to-treat approach, which continues to follow practices that no longer participate in CPC+. We do not have participation data starting in 2020 (i.e., PY 4) because TCPI ended in September 2019.

[i] We measured participation based on the non-claims-based payment extract. We do not have participation data starting in 2019 (i.e., PY 3) because BPCI ended in September 2018.

[j] BPCI Advanced began in October 2018 (i.e., PY 2). We measured participation based on the non-claims-based payment extract. Data for 2020 (i.e., PY 4) were incomplete for BPCI Advanced. We expect final data to be available in early 2022.

ACO = Accountable Care Organization; AHC = Accountable Health Communities; BPCI = Bundled Payment for Care Improvement; CI = confidence interval; CMS = Centers for Medicare & Medicaid Services; CPT = Current Procedural Terminology; FFS = fee-for-service; FQHC = Federally Qualified Health Center; HCC = hierarchical condition category; MDM = CMS Master Data Management System; n.a. = not applicable; NPI = National Provider Identifier; PY = Program Year; RHC = Rural Health Clinic; SSP = Medicare Shared Savings Program; TCPI = Transforming Clinical Practice Initiative; TIN = Taxpayer Identification Number.

Table 5.G.3. Participation in other initiatives by beneficiaries in CPC+ practices and comparison practices in the baseline and first four program years, Track 2

Total beneficiary participation in CMS initiatives was high for SSP, but less than 15 percent for all other initiatives. Comparison practices had participation similar to that of CPC+ practices over time, except for SSP and TCPI, for which participation grew by at least 5 percentage points more among comparison practices than among CPC+ practices in certain program years.

	Time period	Percentage of Medicare FFS beneficiaries exposed to the initiative		Percentage point difference	Percentage point difference-in-differences estimate (90% CI)
		CPC+ group	Comparison group		
Type of initiative: Medicare FFS Care Management Charges					
Name of initiative					
Chronic Care Management (all beneficiaries)	Base	1.5	1.9	-0.5	n.a.
	PY 1	0.7	2.5	-1.8	-1.3*** (-1.7, -1.0)
	PY 2	1.2	3.0	-1.8	-1.3*** (-1.7, -0.9)
	PY 3	1.4	3.5	-2.1	-1.6*** (-2.0, -1.3)
	PY 4	1.6	4.3	-2.7	-2.2*** (-2.7, -1.7)
Chronic Care Management (high-risk beneficiaries[a])	Base	3.0	4.2	-1.2	n.a.
	PY 1	1.7	5.2	-3.5	-2.3*** (-3.0, -1.6)
	PY 2	2.8	6.3	-3.5	-2.3*** (-3.1, -1.5)
	PY 3	3.2	7.6	-4.4	-3.2*** (-3.9, -2.5)
	PY 4	4.1	9.4	-5.2	-4.0*** (-4.8, -3.2)
Transitional Care Management (all beneficiaries)	Base	4.8	3.4	1.3	n.a.
	PY 1	5.3	3.8	1.5	0.1 (0.0, 0.3)
	PY 2	5.8	4.2	1.6	0.2** (0.1, 0.4)
	PY 3	6.1	4.7	1.4	0.1 (-0.1, 0.3)
	PY 4	4.7	4.0	0.7	-0.6*** (-0.8, -0.4)
Transitional Care Management (high-risk beneficiaries[a])	Base	11.0	8.0	3.0	n.a.
	PY 1	12.3	8.8	3.5	0.4* (0.1, 0.8)
	PY 2	12.6	9.2	3.4	0.4 (-0.1, 0.0)
	PY 3	12.9	10.0	3.0	-0.1 (-0.6, 0.4)
	PY 4	10.2	8.5	1.6	-1.4*** (-2.0, -0.9)
Other care management[b] (all beneficiaries)	Base	2.7	2.2	0.5	n.a.
	PY 1	3.8	3.3	0.5	0.1 (-0.3, 0.4)
	PY 2	4.6	4.2	0.4	-0.1 (-0.7, 0.5)
	PY 3	5.6	4.9	0.7	0.2 (-0.5, 0.9)
	PY 4	5.5	4.9	0.5	0.1 (-0.6, 0.7)
Other care management[b] (high-risk beneficiaries[a])	Base	4.1	4.3	-0.2	n.a.
	PY 1	6.0	6.0	0.0	0.2 (-0.4, 0.7)
	PY 2	7.6	7.5	0.2	0.4 (-0.4, 1.1)
	PY 3	10.0	9.2	0.7	0.9** (0.2, 1.7)
	PY 4	10.0	9.6	0.4	0.6 (-0.2, 1.4)
Combined measure of care management services					
Any care management[c] (all beneficiaries)	Base	8.4	6.9	1.5	n.a.
	PY 1	9.3	8.7	0.6	-0.9*** (-1.4, -0.4)
	PY 2	10.8	10.1	0.6	-0.9** (-1.5, -0.2)
	PY 3	11.9	11.5	0.4	-1.1** (-1.9, -0.4)
	PY 4	10.7	11.5	-0.8	-2.3*** (-3.1, -1.5)
Any care management[c] (high-risk beneficiaries[a])	Base	16.5	14.4	2.1	n.a.
	PY 1	18.2	17.5	0.7	-1.4*** (-2.2, -0.6)
	PY 2	20.6	19.5	1.1	-1.1* (-2.0, -0.2)
	PY 3	22.7	22.3	0.3	-1.8*** (-2.8, -0.8)
	PY 4	20.9	22.6	-1.7	-3.8*** (-4.9, -2.7)

Table 5.G.3 *(continued)*

	Time period	Percentage of Medicare FFS beneficiaries exposed to the initiative: CPC+ group	Percentage of Medicare FFS beneficiaries exposed to the initiative: Comparison group	Percentage point difference	Percentage point difference-in-differences estimate (90% CI)
Type of initiative: Other Medicare FFS value-based purchasing models[d]					
Name of initiative					
Medicare Shared Savings Program Practitioner-level MDM[d,e]	Base	44.2	44.2	0.0	n.a.
	PY 1	44.8	53.6	-8.7	-8.7*** (-11.8, -5.7)
	PY 2	41.6	51.7	-10.1	-10.1*** (-13.8, -6.4)
	PY 3	46.4	55.8	-9.4	-9.4*** (-13.7, -5.1)
	PY 4	48.1	54.4	-6.3	-6.3** (-10.5, -2.1)
Medicare Shared Savings Program Beneficiary-level MDM[d,f]	Base	41.2	38.1	3.1	n.a.
	PY 1	42.9	46.5	-3.6	-6.7*** (-9.4, -4.1)
	PY 2	39.6	43.4	-3.7	-6.9*** (-10.0, -3.7)
	PY 3	44.5	47.8	-3.3	-6.4*** (-9.8, -3.0)
	PY 4	45.3	46.0	-0.7	-3.8* (-7.2, -0.5)
Next Generation Practitioner-level MDM[d,g]	Base	0.2	0.0	0.2	n.a.
	PY 1	1.1	3.0	-2.0	-2.1*** (-3.2, -1.0)
	PY 2	1.4	3.7	-2.3	-2.5*** (-3.8, -1.3)
	PY 3	1.2	3.1	-1.9	-2.1*** (-3.3, -0.9)
	PY 4	1.2	2.5	-1.3	-1.5** (-2.6, -0.3)
Next Generation Beneficiary-level MDM[d,f]	Base	0.0	0.0	0.0	n.a.
	PY 1	1.1	3.0	-1.9	-1.9*** (-2.8, -0.9)
	PY 2	1.2	3.5	-2.3	-2.3*** (-3.3, -1.4)
	PY 3	1.1	3.0	-1.9	-1.9*** (-2.7, -1.0)
	PY 4	1.2	2.6	-1.4	-1.4*** (-2.2, -0.6)
Type of initiative: Other primary care transformation initiatives					
Name of initiative					
Accountable Health Communities	Base	-	-	-	-
	PY 1	-	-	-	-
	PY 2	0.1	0.3	-0.3	n.a.
	PY 3	0.6	0.8	-0.2	n.a.
	PY 4	1.4	1.1	0.3	n.a.
Transforming Clinical Practice Initiative[h]	Base	9.9	12.8	-2.9	n.a.
	PY 1	9.9	14.5	-4.6	-1.7** (-3.0, -0.4)
	PY 2	2.0	12.1	-10.1	-7.3*** (-9.3, -5.2)
	PY 3	2.0	7.4	-5.4	-2.5 (-5.2, 0.2)
	PY 4	-	-	-	-
Type of initiative: Bundled payment initiatives					
Name of initiative					
Bundled Payment for Care Improvement[i]	Base	1.7	1.8	-0.1	n.a.
	PY 1	1.5	1.5	0.0	0 (0.0, 0.1)
	PY 2	1.0	1.0	0.0	0.1* (0.0, 0.2)
	PY 3	-	-	-	-
	PY 4	-	-	-	-
Bundled Payment for Care Improvement – Advanced[j]	Base	-	-	-	-
	PY 1	-	-	-	-
	PY 2	1.0	0.8	0.2	n.a.
	PY 3	1.8	1.4	0.4	n.a.
	PY 4	-	-	-	-

Source: Analysis of Medicare FFS claims for 2016 through 2020; MDM extracts from January 27, 2017, February 23, 2018, February 26, 2019, February 28, 2020, and February 25, 2021; CMS January 2017, 2018, 2019, and 2020 TCPI rosters; CMS 2021 AHC roster; and the non-claims-based payment extract, which had payments up to January 2021.

Table 5.G.3 *(continued)*

Notes: We report participation in initiatives as the percentage of beneficiaries who were exposed to the initiative in each period in each group (Track 2 CPC+ or comparison practices), with comparison practices weighted using matching weights. Initiatives that are not at the beneficiary level are weighted by the number of beneficiaries assigned to that practice during the baseline period, so that the results can also be interpreted as the percentage of beneficiaries who were participating in the initiative. We calculated the difference in participation in a given year between Track 2 CPC+ and comparison practices as the percentage point difference. We calculated the difference-in-differences estimate as the difference in percentage participation between CPC+ and comparison practices in the relevant program period (PY 1 through PY 4), minus the difference in the baseline period. The difference-in-differences estimate is in percentage point units. We estimated 90 percent confidence intervals calculating standard errors using linear regression and clustering at the practice level. Dashes (-) indicate that participation or difference values are not available, due to limitations of the data source. n.a. indicates that the difference-in-differences estimate is not applicable, because we do not have data for the baseline period. 0.0 indicates that <0.05 percent of beneficiaries participated in the initiative. Note that the percentage point difference and the percentage point difference-in-differences estimates shown may differ from the corresponding calculations based on the percentages in the cells due to rounding. For Medicare FFS Care Management Charge initiatives, the population we used to calculate participation is indicated under the name of the initiative in parentheses. For the rest of the initiatives, we used the full population.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[a] We defined high-risk beneficiaries as those who had an HCC score greater than the 90th percentile of the distribution of HCC scores among assigned beneficiaries within their track or had Alzheimer's disease or dementia as indicated by the Chronic Conditions Warehouse. For baseline, we calculated HCC scores from 2015 claims. For the intervention period, we calculate HCC scores from 2016 claims.

[b] This includes CPT codes G0181 (physician supervision of a Home Health Agency patient, patient not present), G0182 (physician supervision of hospice patient, patient not present), G0502-G0504 and 99492-99494 (Collaborative Care Model), G0505 and 99483 (cognitive and function assessment for patient with cognitive impairment), G0511 (General Care Management Services for use by RHCs and FQHCs), G0512 (psychiatric collaborative care model for use by RHCs and FQHCs), 99497 (advance care planning), and G2064-G2065 (Principal Care Management Services). These codes capture some type of care management but are not chronic care management or transitional care management codes.

[c] This includes beneficiaries whose physicians billed at least one chronic care management, transitional care management, or other care management service.

[d] The date used to define whether a practice participated in SSP and Next Gen at baseline was January 1, 2017 (consistent with the date used to define participation in comparison group selection). Accordingly, we defined the PY 1 participation value as participation as of January 1, 2018, the PY 2 participation value as participation as of January 1, 2019, the PY 3 participation value as participation as of January 1, 2020, and the PY 4 participation value as participation as of January 1, 2021.

[e] In the practitioner MDM, 91 percent of participation in SSP is counted at the TIN level, while the remaining 9 percent is at the NPI-TIN level. If an NPI was listed in the practitioner MDM, we counted all practices with an NPI-TIN listed in that year as participating in SSP. If the NPI was missing in the practitioner MDM, we counted all practices with the TIN listed in that year as participating in SSP.

[f] In the beneficiary MDM, participation is at the beneficiary level and we measured participation as the fraction of beneficiaries in each sample (i.e., CPC+ and comparison group practices) who participated in the initiative. Because inferring beneficiary participation from practitioner participation tends to inflate participation, we separately measured participation based on the beneficiary MDM as a robustness check for the measure of participation based on the practitioner MDM.

[g] In the practitioner MDM, participation in Next Gen is at the NPI-TIN level. We counted all practices with an NPI-TIN listed in that year as participating in Next Gen.

[h] CPC+ practices were technically unable to participate in TCPI during the CPC+ intervention period; however, we found that 10.3 percent of CPC+ practices did not withdraw from TCPI before the beginning of 2017. This is likely because the practices did not immediately initiate withdrawal. For PY 2 and PY 3, we also found lower but non-zero participation rates among CPC+ practices (2.6 and 2.7 percent), which may be explained by additional belated withdrawals, differences between the IQVIA and CMS practitioner rosters, or the intent-to-treat approach, which continues to follow practices that no longer participate in CPC+. We do not have participation data starting in 2020 (i.e., PY 4) because TCPI ended in September 2019.

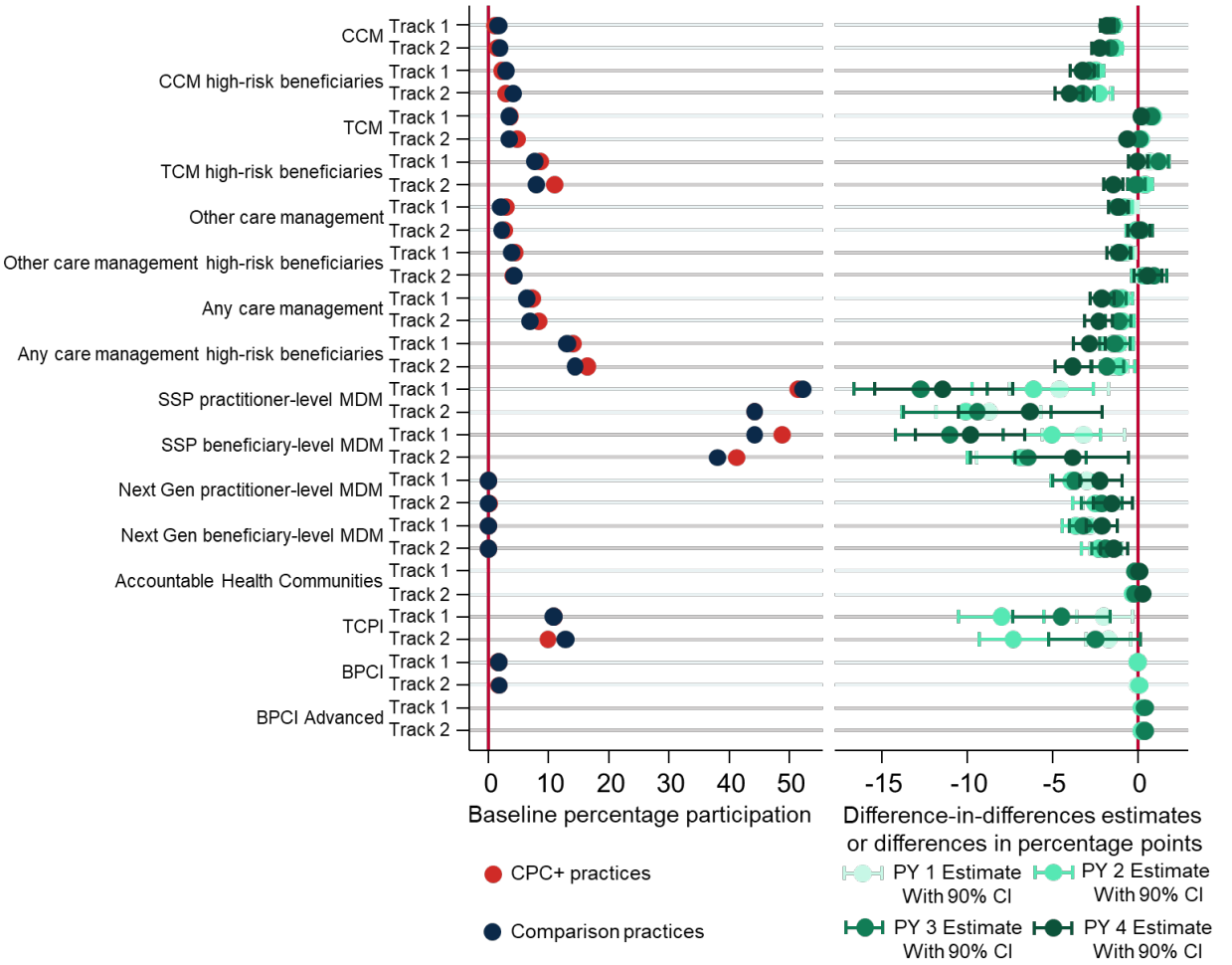
[i] We measured participation based on the non-claims-based payment extract. We do not have participation data starting in 2019 (i.e., PY 3) because BPCI ended in September 2018.

[j] BPCI Advanced began in October 2018 (i.e., PY 2). We measured participation based on the non-claims-based payment extract. Data for 2020 (i.e., PY 4) were incomplete for BPCI Advanced. We expect final data to be available in early 2022.

ACO = Accountable Care Organization; AHC = Accountable Health Communities; BPCI = Bundled Payment for Care Improvement; CI = confidence interval; CMS = Centers for Medicare & Medicaid Services; CPT = Current Procedural Terminology; FFS = fee-for-service; FQHC = Federally Qualified Health Center; HCC = hierarchical condition category; MDM = CMS Master Data Management System; n.a. = not applicable; NPI = National Provider Identifier; PY = Program Year; RHC = Rural Health Clinic; SSP = Medicare Shared Savings Program; TCPI = Transforming Clinical Practice Initiative; TIN = Taxpayer Identification Number.

Figure 5.G.1. Participation in other initiatives by beneficiaries in CPC+ practices and comparison practices in the baseline year and difference-in-differences estimates for the first four program years: Track 1 and Track 2

Total beneficiary participation in CMS initiatives at baseline was high for SSP, but less than 15 percent for all other initiatives. Comparison practices had participation similar to that of CPC+ practices over time, except for SSP and TCPI, for which participation grew by more than 5 percentage points more among comparison practices than among CPC+ practices in certain program years.



Source: Analysis of Medicare FFS claims for 2016 through 2020; MDM extracts from January 27, 2017, February 23, 2018, February 26, 2019, February 28, 2020, and February 25, 2021; CMS January 2017, 2018, 2019, and 2020 TCPI rosters; CMS 2021 AHC roster; and the non-claims-based payment extract with the latest available payment date of January 2021.

Notes: We report participation in initiatives as the percentage of beneficiaries who were exposed to the initiative in each period in each group (CPC+ or comparison practices in each track), with comparison practices weighted using matching weights. We calculated the difference-in-differences estimate as the difference in percentage participation between CPC+ and comparison practices in the relevant program period (PY 1 through PY 4) minus the difference in the baseline period. The difference-in-differences estimate is in percentage point units. We estimated 90 percent confidence intervals calculating standard errors using linear regression and clustering at the practice level. For programs that were not present at baseline (i.e., AHC and BPCI Advanced) we report differences between CPC+ and comparison practices in participation in percentage point units instead of difference-in-difference estimates.

AHC = Accountable Health Communities; BPCI = Bundled Payments for Care Improvement Initiative; CI = confidence interval; CMS = Centers for Medicare & Medicaid Services; CCM = chronic care management; DD = difference-in-differences; MDM = CMS Master Data Management System; PY = Program Year; SSP = Medicare Shared Savings Program; TCM = transitional care management; TCPI = Transforming Clinical Practice Initiative.

A. Billing for Medicare FFS care management services

Billing for Medicare FFS care management services was for less than 12 percent of beneficiaries and relative changes from the baseline period to the first four years of CPC+ between CPC+ and comparison practices were less than 3 percentage points.

- Between 7 and 12 percent of CPC+ assigned[118] Medicare FFS beneficiaries and between 6 and 12 percent of comparison beneficiaries had claims for at least one of the care management service types (transitional care management [TCM], CCM, or other care management) over the five years we examined.
- Less than 7 percent of Medicare FFS beneficiaries had claims for each particular type of these services over the five years examined.
- CPC+ and comparison practices experienced small changes over time.
  - From the baseline to first four years of CPC+, CPC+ practices had less than 1 percentage point change in their billing for CCM services, while comparison practices increased their billing for CCM services by less than 3 percentage points.
  - CPC+ practices increased their billing for TCM services by 0.1 to 0.9 percentage points more than comparison practices in the first three program years. In PY 4, both CPC+ and comparison practices decreased TCM billing by 0.7 to 1.4 percentage points, but the decrease was slightly larger for CPC+ practices than for comparison practices. This finding may be driven by coronavirus disease 2019 (COVID-19); we found that both CPC+ and comparison regions experienced a reduction in service utilization in 2020, but the reduction was 1 percent larger in CPC+ regions than in comparison regions.
  - In the case of Track 1 practices, CPC+ practices increased their billing for other care management services[119] from baseline to PY 4 by 1.1 percentage points less than comparison practices, while in the case of Track 2, CPC+ practices increased their billing by 0.1 percentage point more than comparison practices.
  - The proportion of beneficiaries who had any claims for care management services grew by 2 to 5 percentage points for both CPC+ and comparison practices between baseline and PY 4, with comparison practices' participation growing by 2 percentage points more than CPC+ practices' for Tracks 1 and 2.

[118] Assigned Medicare FFS beneficiaries are those who are in our intent-to-treat sample. Under our intent-to-treat approach, beneficiaries are assigned to the first CPC+ practice or comparison practice to which they were attributed in the baseline or follow-up period, even if they began seeing a different primary care practice more frequently later in that period (as long as they satisfy the eligibility criteria).

[119] This includes the following services: advance care planning, collaborative care model, cognition and functional assessment for patient with cognitive impairment, physician supervision of hospice or home health patient where patient is not present, and principal care management. Note that the cognitive and functional assessment and collaborative care model billing codes were only active starting January 1, 2017, and principal care management codes were only active starting January 1, 2020.

The difference-in-differences estimates are quantitatively small (less than 3 percentage points) due to low overall use of these types of claims throughout the observation period. We checked whether the low use could reflect that only a limited population of beneficiaries were eligible. However, even among high-risk beneficiaries, less than 25 percent of such beneficiaries received care management services and the difference-in-differences estimates remained less than 4 percentage points. These small differences will be unlikely to translate into substantial differences in Medicare expenditures, and thus unlikely to affect estimated impacts of CPC+.

Our analysis above focuses on provision of billable care management services. However, to understand the potential implications on beneficiaries' health, we would want to know the differences in total care management services (billable and non-billable) between CPC+ and comparison practices. Differences in total care management services might significantly differ from billable services for CCM services, because CPC+ practices are unable to bill previously attributed beneficiaries for these services. However, findings from the CPC+ Care Delivery Reporting data (Chapter 4.3.2) indicate there has been little increase in the number of CPC+ beneficiaries receiving longitudinal or episodic care management services over the course of CPC+, suggesting that our findings on billings of services might also translate into provision of services.

B. Participation in other Medicare FFS value-based purchasing models

In the first four program years, participation in other Medicare FFS value-based purchasing models grew among comparison practices relative to CPC+ practices, with the gap in participation between the two groups either widening or remaining constant in each year.[120]

Participation in SSP was 41 to 59 percent and increased among comparison practices by 5 to 13 percentage points more than among CPC+ practices, depending on the program year and track. Participation in SSP among both CPC+ and comparison practices was large, with roughly half of the practices participating each year. Participation in SSP started off similar at baseline for CPC+ and comparison practices, with less than a one percentage point difference in participation for both Track 1 and Track 2 practices. Over the four program years, participation in SSP among comparison practices increased, while among CPC+ practices the changes depend on track.

- For Track 1, participation in SSP among CPC+ practices declined by 6.2 percentage points between baseline and PY 4, while participation among comparison practices overall rose by 5.2 percentage points. Across the first four program years, the difference in participation between CPC+ and comparison practices widened for Track 1, resulting in a -11.4 difference-in-differences estimate.

[120] For comparison selection, we measured baseline participation status for SSP and Next Gen as of January 1, 2017. Therefore, we measured participation in the first year of CPC+ as participation as of January 1, 2018, which was the end of PY 1, participation in the second year of CPC+ as participation as of January 1, 2019, which was the end of PY 2, participation in the third year of CPC+ as participation as of January 1, 2020, which was the end of PY 3, and participation in the fourth year of CPC+ as participation as of January 1, 2021, which was the end of PY 4.

- For Track 2, we observed a slightly different pattern: from baseline to PY 4, participation among CPC+ practices increased by 3.9 percentage points, while participation among comparison practices increased by 10.2 percentage points, resulting in a -6.3 difference-in-differences estimate.

Participation in Next Gen remained lower than 5 percent, but increased among comparison practices by 1 to 2 percentage points more than among CPC+ practices by PY 4. The CPC+ and comparison groups started out at close to 0 percent participation in the baseline period. This is because practices participating in CPC+ were not permitted to join Next Gen, and in the comparison selection process, we restricted potential comparison practices to those that were also not participating in Next Gen during the baseline period.[121] Participation among Track 1 CPC+ practices grew very little, to only 1.2 percent by PY 4 (because only CPC+ practices that stopped participating in CPC+ could join Next Gen); in contrast, participation among their comparison counterparts grew to 3.3 percent by PY 4. Track 2 experienced a very similar pattern: participation among CPC+ practices grew to 1.2 percent by PY 4, and participation among comparison group practices grew to 2.5 percent by PY 4. For Track 1 and Track 2, the PY 4 difference-in-differences estimates of -2.2 and -1.5 percentage points, respectively, are statistically significant at the 5 percent level.

In general, the increase in Next Gen participation is consistent with the fact that the number of Accountable Care Organizations (ACOs) participating in Next Gen has increased since it started in 2016.

For both SSP and Next Gen, the difference in participation rates narrowed from PY 3 to PY 4 in both tracks. CPC+ practices either slightly increased or maintained their rate of participation in these initiatives from PY 3 to PY 4, but the comparison practices slightly reduced participation from PY 3 to PY 4, resulting in their participation rates becoming more similar.

- For SSP, the Track 1 difference-in-differences estimate went from -12.7 in PY 3 to -11.4 in PY 4, and for Track 2, it went from -9.4 to -6.3.
- For Next Gen, the Track 1 difference-in-differences estimate went from -3.7 in PY 3 to -2.2 in PY 4, and for Track 2, it went from -2.1 to -1.5.

  This could just be due to chance, but one potential explanation is that CPC+ practices were better prepared for disruptions due to COVID-19 than comparison practices and were better able to maintain participation in these initiatives during the pandemic than the comparison practices.

Robustness checks using the beneficiary-level MDM showed lower levels of participation in SSP and Next Gen by up to 8.6 percentage points but similar trends in participation as the practitioner-level MDM. Since there are similar trends using the beneficiary-level MDM, the

[121] Participation was not exactly zero, because the IQVIA practitioner rosters we use are not the same as the CMS rosters. Therefore, a couple of CPC+ practices are marked as participating in Next Gen based on the fact that at least one practitioner affiliated with the practice, according to the IQVIA data, had participated in Next Gen.

beneficiary-level MDM difference-in-differences estimates are similar to the practitioner-level MDM estimates for both SSP and Next Gen.

For both SSP and Next Gen, we mostly calculated lower participation rates when we used the beneficiary-level MDM rather than the practitioner-level MDM, rolling it up to the practice level and then weighting by the number of beneficiaries to get beneficiary-level estimates. The beneficiary-level MDM SSP participation rates for all analysis groups in the baseline year were about 1 to 9 percentage points lower than the rates calculated using the practitioner-level MDM. The beneficiary-level Next Gen participation rates for most analysis groups in the baseline year were about 0 to 0.4 percentage points lower than the rates calculated using the practitioner-level MDM; the rates from the beneficiary-level MDM were also sometimes higher than those from the practitioner-level MDM but at most by 0.2 percentage points.[122]

The differences between the practitioner- and beneficiary-level rates is likely explained by our method of calculating these rates. For the rate using the practitioner-level MDM, we considered a practice (and all of its assigned beneficiaries) as participating in an ACO model (i.e., SSP or Next Gen) if at least one of its practitioners participated in an ACO. This blanket approach naturally inflates the participation rate because we flagged beneficiaries as participating in an ACO if *any practitioner in* their assigned *practice* was identified as participating in an ACO, even if the ACO-aligned practitioner did not provide any care for the beneficiary. In contrast, we calculated the beneficiary-level participation rate based on beneficiaries' actual alignment to ACOs according to the MDM, regardless of their practitioners' or practice's alignment.[123]

C. Participation in other primary care transformation initiatives

Participation in AHC was low among CPC+ and comparison practices. We found less than 2 percent participation in AHC for CPC+ and comparison groups from PY 2 (the first year of the model that beneficiaries were attributed) through PY 4.

Through PY 3, participation in TCPI fell among CPC+ practices and remained more constant among comparison practices.[124] TCPI participation among CPC+ practices remained stable between baseline and PY 1, and then decreased by 7.7 percentage points for Track 1 and 7.9 percentage points for Track 2 in PY 2. Participation then remained at the same small rate of

[122] We found a larger difference in the participation rates between the practitioner- and beneficiary-level MDMs for SSP than for Next Gen. This is likely due to the fact that in the practitioner-level MDM, less than 10 percent of SSP records have both a Taxpayer Identification Number (TIN) and a National Provider Identifier (NPI), while the remaining 90 percent only have a TIN. As a result, if at least one TIN assigned to the practice participated in SSP, all of the practice's assigned beneficiaries were counted as participating in SSP. Conversely, all of the Next Gen records have both a TIN and an NPI, so a practice's beneficiaries were only counted as participating in Next Gen if the NPI/TIN combination was assigned to that practice.

[123] Both SSP and Next Gen use a prospective beneficiary alignment method that determines beneficiary participation prior to the start of a performance year. After the performance year, both models may retroactively reconcile or exclude beneficiaries based on applicable eligibility criteria (i.e., death). The beneficiary-level MDM includes the final reconciled beneficiary alignment list for the baseline and first three CPC+ program years (i.e., 2016 to 2019).

[124] We analyzed TCPI through PY 3 (i.e., 2019) because TCPI ended in September 2019.

about 2 to 3 percent in PY 3. Alternatively, comparison practices' participation remained relatively constant between 10 and 15 percent through PY 2, and then decreased in PY 3 to around 7 percent—possibly due to anticipation of the initiative's end.[125] This led to difference-in-differences estimates in the last year of TCPI (PY 3) of -4.5 percentage points and -2.5 percentage points for Track 1 and Track 2, respectively. The higher participation rate of the comparison group practices in TCPI suggests that some CPC+ practices would have participated in TCPI even in the absence of CPC+. Since some comparison practices receive learning supports, the difference in learning supports between CPC+ and comparison practices is lower than the total learning supports that CPC+ practices receive through CPC+.

D. Participation in CMS bundled payment initiatives

Participation in Bundled Payment for Care Improvement (BPCI) and BPCI Advanced was less than 2 percent. We found low levels of participation in the BPCI and BPCI Advanced initiatives for CPC+ and comparison groups in both tracks. For BPCI, which ended in September 2018, there were around 1 percentage point decreases in participation among both groups. For BPCI Advanced, which began in October 2018, for both tracks, there was an 0.8 percentage point increase in participation among CPC+ practices and 0.6 percentage point increase among comparison practices. The lack of difference between CPC+ and comparison practices is not surprising, since BPCI and BPCI Advanced are national models and both CPC+ and comparison practices can participate in it.

5.G.4. Implications for CPC+ impact analyses

The moderately larger increases in participation in Medicare FFS value-based purchasing models for comparison group practices compared to CPC+ practices could decrease the marginal impact of the CPC+ incentives and supports in improving primary care, relative to a case in which these other initiatives did not exist. That is, if these other initiatives are encouraging types of changes in the comparison group similar to those occurring in the CPC+ group, and the changes improve outcomes, we may observe only small effects of CPC+ or none at all, even if the CPC+ model of care transformation is indeed effective in improving quality or lowering costs. However, the initiative for which these differential changes in participation between the CPC+ and comparison group are the largest—SSP—is a nationwide program, and the comparison group's participation likely represents the correct counterfactual to the scenario in which CPC+ did not exist. Based on findings from our analysis, we will conduct a sensitivity test to our primary impact analyses, controlling for contemporaneous SSP. This will shed light on whether our impact results are at all driven by SSP participation.

Due to the sizeable differential changes in participation between the CPC+ and comparison groups in SSP during the intervention period, the SSP subgroups should be interpreted with caution, as there is increasing participation in SSP of the comparison group in the non-SSP subgroup—defined at baseline, and decreasing participation in SSP of the CPC+ group in the

[125] Although active CPC+ practices are not allowed to participate in TCPI, positive participation during CPC+ likely reflects additional belated withdrawals from TCPI, differences between the IQVIA roster of practitioners participating in CPC+ and the actual CMS CPC+ practitioner rosters, or practices that stopped participating in CPC+ (but are still included in the intent-to-treat sample) and joined TCPI.

SSP subgroup for Track 1. Instead of interpreting the SSP subgroup estimates as the impact of CPC+ combined with SSP throughout the intervention period, these estimates should be interpreted as the impact of ***starting*** CPC+ in SSP. Participation in Next Gen by both the CPC+ and comparison groups remains low, and while it has grown slightly more for the comparison group, the gap in participation remains low, which suggests that contamination by Next Gen is unlikely to bias our estimates.

5.G.5. Future initiatives

Although there appears to be little risk that the current set of initiatives bias our CPC+ impacts, CMS will be making several changes to regulations and initiatives (specifically, Primary Care First and Direct Contracting) that could affect our estimates in future years of CPC+ (Table 5.G.4). We plan to track participation in these initiatives, and if we find large possible differential participation between the CPC+ and comparison groups, we will adjust our methodology accordingly to ensure that our impact estimates remain unbiased.

Table 5.G.4. Selected regulatory reforms and programmatic changes related to CPC+

Program	Time period	Potential implications for CPC+
New payment model options under the CMS Primary Cares Initiative		
Primary Care First (PCF) Building on the principles of CPC+, but with more focus on paying for outcomes than for model implementation, this 5-year model provides payment to reward advanced primary care practices that are ready to assume financial risk in exchange for reduced administrative burden and performance-based payments. It will be offered in 26 regions, including the current 18 CPC+ regions, and 2 of the CPC+ comparison regions. A second model option encourages practices to take responsibility for members of a high-cost, high-need seriously ill population, who currently lack a primary care practitioner or effective care coordination.	Primary Care First component: Two 5-year cohorts, beginning January 1, 2021, and January 1, 2022 Seriously ill population component: Two 5-year cohorts, beginning in April 1, 2021, and April 1, 2022	In 2021, CPC+ comparison group practices in PCF regions can join PCF. In 2022, CPC+ practices can leave CPC+ to join PCF. Differences in participation in non-CPC+ initiatives between CPC+ and comparison practices could decrease the estimated impacts of the CPC+ incentives and supports in improving primary care, if those other initiatives are encouraging comparison group practices to make changes similar to those occurring in the CPC+ group.
Direct Contracting (DC) The objective of the DC model is to engage a wider variety of organizations, beyond primary care practices, with experience taking on financial risk and serving larger patient populations, such as ACOs, Medicare Advantage plans, and Medicaid managed care organizations. Model options include global population-based payment (100% financial risk via primary care capitation or total care capitation), professional (share 50% risk with CMS via primary care capitation), and geographic (assume responsibility for the total cost of care and health needs of a population in a defined target region).	April 1, 2021, through Dec 31, 2025	CPC+ comparison practices can participate in DC if they are part of a larger organization (e.g., a Medicare ACO) that decides to participate. CPC+ practices cannot participate in DC. Differences in participation in non-CPC+ initiatives between CPC+ and comparison practices could decrease the estimated impacts of the CPC+ incentives and supports in improving primary care, if those other initiatives are encouraging comparison group practices to make changes similar to those occurring in the CPC+ group.

5.H. Estimated impacts of CPC+ on long-term opioid use and potential opioid overuse

In this Appendix, we examine the impact of the Comprehensive Primary Care Plus (CPC+) model on the long-term use of prescription opioids and the potential overuse of prescription opioids for Medicare fee-for-service (FFS) beneficiaries during the first four years of CPC+. In Section 5.H.1, we describe the motivation for this analysis, including an overview of how CPC+ could affect potential opioid overuse. We next explain the analytic methods, study population, and key outcomes of interest (Section 5.H.2). Finally, we describe the results (Section 5.H.3) and discuss their implications and the limitations of this analysis (Section 5.H.4).

What is known on this topic

- Primary care practitioners prescribe the largest volume of Medicare Part D opioid prescriptions.
- The literature suggests that several primary care interventions—such as enhanced medication management and integration of behavioral health into primary care—might be effective at reducing high-dose opioid prescribing; however, prior studies have been limited in terms of number of practice sites and patients included.

Key findings

- Relative to Medicare fee-for-service beneficiaries in comparison practices, beneficiaries attributed to CPC+ practices experienced:
- Greater reduction in long-term use of prescription opioids in the third and fourth program years in Track 2 and only in the third program year in Track 1.
- Greater reduction in potential overuse of prescription opioids in the third and fourth program years for both tracks.

Implications

- Although our findings suggest that a large-scale primary care intervention can reduce opioid overuse, the relationship between the favorable impact findings and improvements in care processes in CPC+ warrants further exploration. This is because the strength of comprehensive medication management and behavioral health integration varied across practices, and there were other simultaneous changes in care processes.

5.H.1. Introduction

Opioid use among Medicare beneficiaries is associated with more adverse events, and higher rates of emergency department (ED) visits, hospitalizations, and mortality than in other populations (Song 2017; Lehmann and Fingerhood 2018; Yoshikawa et al. 2020). Because they often use opioids for chronic pain, Medicare beneficiaries typically obtain them from a physician rather than other sources (Schepis et al. 2020). Further, primary care practitioners write the largest volume of Medicare Part D opioid prescriptions (Chen et al. 2016). Therefore, interventions that focus on prescribing in primary care have a great potential to reduce harm from opioid overuse among Medicare beneficiaries.

The 2016 Centers for Disease Control and Prevention (CDC) guidelines for pain management encouraged the use of non-opioid alternatives (such as cognitive behavioral therapy and nonsteroidal anti-inflammatory drugs) as first-line treatments in the management of chronic pain (Dowell et al. 2016). Over the past five years, many other resources have been created or improved to help clinicians manage patients' chronic pain and safely prescribe opioids, most notably assessments, guidelines, decision tools, and prescription drug monitoring programs (PDMPs) (AAFP 2021; NIDA 2021). Even though opioid dispensing rates per capita have been decreasing since 2013 (CDC 2019), high-dose prescribing remains a problem despite the CDC guidelines to prescribe the lowest effective dosage and avoid increasing daily dosage to 90 morphine milligram equivalents (MMEs) or more (Dowell et al. 2016).

The literature suggests that integrating behavioral health staff and clinical pharmacists into the primary care setting (Seal et al. 2020) and enhancing medication management practices (Parchman et al. 2019) can reduce high-dose opioid prescribing in primary care practices. Further, care management and clinician education can improve adherence to opioid prescribing guidelines (Liebschutz et al. 2017; Meisenberg et al. 2018). However, the studies analyzing these interventions have been limited in the number of practice sites and patients involved and often involve different combinations of interventions.

CPC+ does not have an explicit goal of reducing high-dose opioid prescribing, but participating primary care practices are required to implement several approaches that could change prescribing behaviors. These approaches include comprehensive medication management (CMM), screening for behavioral health conditions, and either co-locating a credentialed behavioral health staff member in the practice or designating a practitioner or team member to provide care management for behavioral health conditions. Practices in both tracks took steps to implement CMM; however, Track 2 practices were required to provide CMM to patients who were likely to benefit—those who received care management or experienced transitions of care (Peikes et al. 2021).

The analysis in this Appendix extends the main CPC+ impact analysis and adds to the literature on the effectiveness of primary care interventions in reducing high-dose prescribing among patients with chronic pain. In this analysis, we examine whether CPC+ impacted long-term use and potential opioid overuse among FFS beneficiaries assigned to CPC+ practices relative to beneficiaries assigned to comparison practices. In addition to analyzing the overall effects of CPC+ on long-term opioid use and potential opioid overuse, we also tested for differential impacts among beneficiaries with disabilities versus beneficiaries without disabilities and among beneficiaries who were dually eligible for Medicare and Medicaid versus those who were not. Beneficiaries with disabilities and dually eligible beneficiaries are especially vulnerable to opioid misuse and abuse (Buchmueller and Carey 2018).

5.H.2. Methods

A. Study design and setting

We analyzed Medicare FFS claims and Medicare Part D prescription drug event data over the baseline period (calendar year 2016) and the first four years of CPC+ (January 2017 through December 2020) for 1,373 Track 1 and 1,515 Track 2 practices that were still enrolled in CPC+

90 days after CPC+ started (Table 5.H.1 and Table 5.H.2). Following the same approach as for the main CPC+ impact analysis, we retained practices in the analysis regardless of whether they disenrolled from CPC+. Every quarter, we attributed beneficiaries to the practice that delivered the largest share of their primary care visits over the prior two years. We then assigned beneficiaries to the CPC+ or comparison groups at two points in time. For the baseline period, we assigned beneficiaries to the first practice to which they were attributed during the baseline period. We followed an intent-to-treat (ITT) rule by continuing to assign the beneficiary to the same practice throughout the baseline period regardless of whether the beneficiary continued to receive care at that practice. We repeated the same process for the intervention period, assigning patients to the first practice to which they were attributed after the intervention began. This ITT approach helps to avoid the potential biases in impact estimates that could arise if we examined only the beneficiaries who remained attributed to practices over time or the practices that remained in the sample. Our sample was therefore a repeated cross-section of beneficiaries with a high degree of overlap in the sample across intervention years due to the ITT rule (Peikes et al. 2021).

We relied on the same external comparison group used for the main impact analysis; that is, we used comparison practices drawn from areas located near the CPC+ regions but often out of state (Ghosh et al. 2020; Kranker et al. 2020).

B. Outcomes

We analyzed the impact of CPC+ on two outcomes: (1) any long-term use of opioids and (2) potential overuse of opioids among long-term users. We selected any long-term use and potential opioid overuse measures for analysis because such use is associated with a higher risk of serious adverse effects, including addiction, misuse, serious fractures, cardiovascular events, and overdose (Von Korff et al. 2011; Els et al. 2017).

Following the specifications for the denominator for the Electronic Clinical Quality Measure (eCQM) 460 (eCQI Resource Center 2021), we defined long-term opioid use as having an opioid supply of 90 days or more in one year with no more than a 7-day gap between prescriptions. Using the same specifications, potential opioid overuse was defined as the use of opioids at a daily dosage of 90 MMEs or more among long-term opioid users.[126] The main difference between our potential opioid overuse measure and eCQM 460 is that our measure relies on Part D claims data, whereas eCQM 460 relies on electronic health record (EHR) data. The key advantages of using Part D claims data are (1) claims data capture prescription fills, not just prescribing behavior, (2) dosage information is more accurate in claims data, and (3) claims data capture filled prescriptions from all prescribers.

To be included in the analysis of long-term use and potential opioid overuse, a beneficiary had to (1) be assigned to a practice, (2) be continuously enrolled in Medicare Parts A, B, and D

[126] Among stakeholders, the key concern about the potential opioid overuse measure (eCQM 460) was the risk that plans that are evaluated on performance on this measure would mandate dosage thresholds, which could result in abrupt tapering by clinicians or sudden discontinuation of opioids (CMS 2018). This limitation is not a concern for our evaluation because there are no penalties or incentives tied to this measure. This measure has great value for monitoring patient safety across time and groups as well as for research purposes, such as in the context of our analysis.

throughout each calendar year or until death, and (3) have at least one opioid prescription during the measurement year (that is, had to have some opioid use). Because eCQM 460 does not list national drug codes (NDCs), to identify beneficiaries who used opioid therapy, we relied on NDCs for opioid therapy from the Medication List Directory value sets for the HEDIS® measure of high dosage opioid use (NCQA 2020, 2021). We used the CDC Opioid NDC and the Oral MME Conversion File (CDC 2021) to calculate daily MME for beneficiaries on opioid therapy.

We excluded beneficiaries for whom opioid use is appropriate: those with a diagnosis of cancer during or one year before the measurement year, and those with a diagnosis of sickle cell disease or with hospice use during the measurement year. To identify diagnoses for exclusion criteria, we used ICD-10 codes from eCQM specifications. Even though potential opioid overuse excludes most of the beneficiaries for whom such use is appropriate (those with cancer or sickle cell disease, and those who use hospice), it does not take *all* appropriate use into account, such as use of opioids in non-hospice palliative care.

Similar proportions of beneficiaries were retained after each exclusion step regardless of track or CPC+ status. The only difference across years (2016 through 2020) is that any opioid use has been decreasing over time (Table 5.H.1 and Table 5.H.2).

After we applied inclusion criteria to the baseline sample, there were 40,219 long-term users and 7,743 beneficiaries who potentially overused opioids in Track 1 CPC+ practices, and there were 129,197 long-term users and 24,289 beneficiaries who potentially overused opioids in their matched comparison practices (Table 5.H.1). Table 5.H.2 shows exclusion criteria for Track 2 practices. The long-term use analysis included all CPC+ and comparison practices because each practice had at least one continuously enrolled beneficiary. The potential opioid overuse analysis excluded a small number of practices that did not have attributed beneficiaries who were long-term users (Table 5.H.1 and Table 2).

Table 5.H.1. Inclusion criteria for baseline (2016) and last follow-up year (2020), by CPC+ versus comparison status, Track 1

	2016 CPC+		2016 Comparison		2020 CPC+		2020 Comparison	
	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next
Number of Medicare FFS beneficiaries assigned to a practice	873,993		2,900,388		1,062,423		3,712,632	
Number of practices	1,373[a]		5,243[b]		1,373[a]		5,242[b]	
Beneficiary inclusion criteria								
Continuously enrolled in Medicare Parts A, B, and D and FFS during the measurement year or until death	610,878	69.9%	1,983,745	68.4%	762,567	71.8%	2,661,279	71.7%
Any opioid use	**211,277**	**34.6%**	**672,275**	**33.9%**	**187,511**	**24.6%**	**641,934**	**24.1%**
Appropriate use criteria								
No cancer in measurement year or in prior year	168,640	79.8%	539,864	80.3%	145,448	77.6%	499,694	77.8%
No sickle cell in measurement year	168,528	99.9%	539,464	99.9%	145,331	99.9%	499,269	99.9%
No hospice use in measurement year	165,130	98.0%	529,358	98.1%	141,249	97.2%	486,043	97.4%
Long-term opioid use and potential overuse								
Long-term opioid use								
Age 18 or older and have a 90+ day supply of opioids in a measurement year with no more than a 7-day gap between prescriptions	40,219	24.4%	129,197	24.4%	34,043	24.1%	114,396	23.5%

Table 5.H.1 (*continued*)

	2016 CPC+		2016 Comparison		2020 CPC+		2020 Comparison	
	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next
Potential opioid overuse								
Long-term users use opioids at a high dosage	7,743	19.3%	24,289	18.8%	4,256	12.5%	14,417	12.6%
Number of practices with long term opioid users[b]	1,355		5,157		1,356		5,152	

Source: Mathematica's analysis of Medicare claims data for 2016 and 2020.

Notes: All the counts and corresponding percentages are raw counts, unadjusted and unweighted.

[a] We excluded from the analysis practices that withdrew from CPC+ in the first three months because they were unlikely to have made much progress implementing CPC+ during that time; there were 17 such practices in the two tracks combined.

[b] In 2020, there was one fewer comparison practice than in 2016 because that practice closed.

[c] Because potential opioid overuse is assessed among long-term users of opioids, the analysis sample excludes CPC+ and comparison practices without assigned beneficiaries who were long-term users.

CPC+ = Comprehensive Primary Care Plus; FFS = fee-for-service.

Table 5.H.2. Inclusion criteria for baseline (2016) and last follow-up year (2020), by CPC+ versus comparison status, Track 2

	2016 CPC+		2016 Comparison		2020 CPC+		2020 Comparison	
	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next
Number of Medicare FFS beneficiaries assigned to a practice	1,067,045		2,462,451		1,301,307		3,144,640	
Number of practices	1,515[a]		3,783		1,515[a]		3,783	
Beneficiary inclusion criteria								
Continuously enrolled in Medicare Parts A, B, and D and FFS during the measurement year or until death	739,337	69.3%	1,687,521	68.5%	930,039	71.5%	2,265,654	72.0%
Any opioid use	**255,320**	**34.5%**	**566,787**	**33.6%**	**226,598**	**24.4%**	**542,175**	**23.9%**
Appropriate use criteria								
No cancer in measurement year or in prior year	204,181	80.0%	453,235	80.0%	176,254	77.8%	420,343	77.5%
No sickle cell in measurement year	204,049	99.9%	452,892	99.9%	176,092	99.9%	419,992	99.9%
No hospice use in measurement year	200,022	98.0%	444,137	98.1%	171,103	97.2%	408,472	97.3%
Long-term opioid use and potential overuse								
Long-term opioid use								
Age 18 or older and have a 90+ day supply of opioids in a measurement year with no more than a 7-day gap between prescriptions	48,747	24.4%	105,437	23.7%	41,164	24.1%	93,665	22.9%

Table 5.H.2 (*continued*)

	2016 CPC+		2016 Comparison		2020 CPC+		2020 Comparison	
	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next	Sample size	Percentage of beneficiaries retained from one step to the next
Potential opioid overuse								
Long-term users who use opioids at a high dosage	9,531	19.6%	20,128	19.1%	5,168	12.6%	11,911	12.7%
Number of practices with long term opioid users[b]	**1,500**		**3,733**		**1,498**		**3,717**	

Source: Mathematica's analysis of Medicare claims data for 2016 and 2020.

Notes: All the counts and corresponding percentages are raw counts, unadjusted and unweighted.

[a] We excluded from the analysis practices that withdrew from CPC+ in the first three months because they were unlikely to have made much progress implementing CPC+ during that time; there were 17 such practices in the two tracks combined.

[b] Because potential opioid overuse is assessed among long-term users of opioids, the analysis sample excludes CPC+ and comparison practices without assigned beneficiaries who were long-term users.

CPC+ = Comprehensive Primary Care Plus; FFS = fee-for-service.

C. Baseline equivalence

After matching, CPC+ and comparison practices in both the long-term use and potential overuse analysis samples had similar (1) baseline characteristics of Medicare FFS beneficiaries (with similar long-term opioid use and potential opioid overuse, chronic conditions, Medicare expenditures, hospitalizations, and ED use); (2) baseline practice characteristics (such as size, health system ownership status, and experience with EHRs and primary care transformation in programs such as CPC Classic and medical homes); and (3) baseline characteristics of the county in which practices were located (such as median income, rural/urban location, and percentage of the population in poverty). These findings applied to both tracks.

For beneficiaries included in the long-term use analysis, nearly all standardized differences in baseline practice and beneficiary characteristics were less than 0.10 (Table 5.H.3). Similarly, balance was excellent for the potential overuse analysis sample (Table 5.H.4). In these two tables, the standardized difference column is color-coded to draw attention to values that fall outside the threshold of ±0.10 standardized differences. For both samples—long-term use and potential overuse—standardized differences were larger in practice and beneficiary subgroups; however, all differences were within 0.25 (data available upon request). Practice subgroups included practices that participated in the Shared Savings Program (SSP) and those that did not. We defined beneficiary subgroups based on whether or not beneficiaries had disabilities or were dually eligible.

Table 5.H.3. Baseline characteristics (2016) for CPC+ and comparison groups in the long-term opioid use analysis sample, by track[a]

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Standardized differences	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,782)	Standardized differences
Long-term opioid use	**8.1**	**7.9**	**0.01**	**8.1**	**7.8**	**0.01**
Beneficiary characteristics						
Demographics						
Age						
18–64	15.9	16.8	-0.02	15.7	17.2	-0.04
65–74	49.2	47.8	0.03	49.5	47.8	0.03
75–84	24.6	24.7	0.00	24.4	24.4	0.00
85 +	10.4	10.7	-0.01	10.4	10.6	-0.01
Race						
White	88.3	88.1	0.01	87.5	87.4	0.00
Black	5.6	5.7	0.00	6.2	6.2	0.00
All other/unknown	6.1	6.2	-0.01	6.3	6.4	0.00
Male	38.7	38.6	0.00	39.0	38.8	0.00
Eligibility for Medicare and Medicaid						
Original reason for Medicare eligibility						
Disability	22.4	23.1	-0.02	22.2	23.4	-0.03
Age	77.1	76.4	0.02	77.4	76.0	0.03
ESRD	0.5	0.5	-0.01	0.5	0.6	-0.01
Dual eligibility	17.9	21.6	-0.10	17.7	21.9	***-0.11***
Presence of chronic conditions[b]						
Chronic obstructive pulmonary disease	11.8	11.6	0.01	11.2	11.3	0.00
Vascular disease, with or without complications	14.7	14.7	0.00	14.5	14.5	0.00
Diabetes with chronic complications	12.4	12.5	0.00	12.8	12.7	0.00
Rheumatoid arthritis and inflammatory connective tissue disease or disorders of immunity	7.2	6.9	0.01	7.0	6.9	0.00
Schizophrenia, major depressive, bipolar, or paranoid disorders	8.4	9.4	-0.04	8.9	9.8	-0.03
Congestive heart failure	9.9	9.9	0.00	9.8	9.9	0.00
Diabetes without complication	13.1	13.0	0.00	12.0	12.5	-0.02
Specified heart arrhythmias	12.7	12.6	0.00	12.7	12.8	0.00
Morbid obesity	5.0	4.8	0.01	4.9	4.9	0.00

Table 5.H.3 (*continued*)

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Standardized differences	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,782)	Standardized differences
Drug/alcohol psychosis or dependence	2.3	2.4	-0.01	2.3	2.5	-0.01
Alzheimer's disease or dementia	6.6	6.9	-0.01	6.6	6.8	-0.01
Risk score[c]						
Mean HCC score	1.06	1.07	-0.01	1.06	1.08	-0.02
Beneficiaries assigned a new enrollee HCC score (i.e., HCC score was calculated based on of demographic characteristics only)	5.9	5.1	0.03	6.9	5.3	0.06
High-risk beneficiary – 75th percentile	21.9	22.3	-0.01	21.8	22.5	-0.02
High-risk beneficiary – 90th percentile	12.7	13.2	-0.01	12.7	13.2	-0.01
Characteristics of the beneficiary's assigned practice[d]						
Prior transformation						
Experience in selected practice transformation activities[e]	53.0	52.3	0.01	80.9	75.1	***0.15***
Participant in SSP ACO as of January 1 of the first intervention year	51.9	52.5	-0.01	44.6	44.0	0.01
Meaningful EHR use[f]						
Never attested	8.0	8.8	-0.03	3.6	3.9	-0.02
Attested since 2011 or 2012	78.8	78.2	0.01	88.0	87.8	0.01
Attested since 2013 or later	13.2	13.0	0.01	8.4	8.3	0.00
Size						
Number of primary care practitioners[g]	6.6	6.9	-0.06	9.4	9.4	0.00
One to two	21.7	22.1	-0.01	13.2	14.0	-0.03
Three to five	32.8	34.4	-0.03	32.2	33.1	-0.02
Six or more	45.5	43.5	0.04	54.6	52.8	0.04
Practice size category[g]						
Small (1 to 2 practitioners)	21.2	21.5	-0.01	12.6	13.3	-0.02
Medium (3 to 24 practitioners)	73.8	74.0	0.00	77.4	78.2	-0.02
Large (25 or more practitioners)	5.0	4.5	0.02	10.0	8.5	0.05
Number of Medicare beneficiaries assigned in the baseline year	1,178	1,126	0.05	1,359	1,297	0.05
Ownership[g]						
Hospital ownership or health system management or ownership	54.8	55.2	-0.01	58.4	59.7	-0.03
Hospital-owned	27.9	28.6	-0.02	29.0	31.1	-0.05

Table 5.H.3 (*continued*)

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Standardized differences	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,782)	Standardized differences
Multispecialty[h]						
Multispecialty practice	19.5	19.8	-0.01	25.7	25.6	0.00
Urbanicity of practice's county (Area Resource File)[i]						
Urban	71.3	70.7	0.01	76.2	74.4	0.04
Suburban	18.4	18.9	-0.01	15.9	17.3	-0.04
Rural	10.3	10.4	-0.01	7.9	8.3	-0.02
Practice county socioeconomic characteristics (Area Resource File)[j]						
Median household income ($)	58,058	57,812	0.02	57,170	57,262	-0.01
Medicare Advantage penetration rate	28.3	28.4	-0.01	31.2	30.3	0.07
Percentage of adults 25 or older with a degree from a four-year college	31.5	31.1	0.04	31.2	31.0	0.02
Percentage of population in poverty	13.8	14.0	-0.03	14.2	14.2	-0.01
Area with a shortage of (primary care) health professionals	1.0	1.2	-0.03	1.3	1.4	-0.01
Hospital beds in county per 10,000 population (Area Resource File)[j]						
1st quartile (fewest beds)	21.4	21.9	-0.01	24.7	23.3	0.03
2nd quartile	28.1	25.4	0.06	24.4	23.7	0.02
3rd quartile	26.2	27.1	-0.02	24.3	26.5	-0.05
4th quartile (most beds)	24.2	25.6	-0.03	26.6	26.5	0.00
U.S. census region[k]						
Northeast	29.3	28.8	0.01	27.7	28.5	-0.02
Midwest	38.8	35.9	0.06	35.0	35.5	-0.01
South	15.0	18.6	***-0.10***	19.1	19.0	0.00
West	17.0	16.6	0.01	18.1	16.9	0.03
Other characteristics						
HRR price index (CMS's Medicare Geographic Variation data, 2015)	1.1	1.1	-0.09	1.0	1.1	-0.08
Service use and expenditures						
Service use (in the baseline year per 1,000 beneficiaries, annualized)						
Acute care hospitalizations	260.4	264.7	0.00	262.5	264.7	0.00
Outpatient ED visits	498.6	514.8	-0.01	496.3	507.9	-0.01

Table 5.H.3 (*continued*)

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,373)	Weighted mean among comparison practices (N = 5,243)	Standardized differences	Mean among CPC+ practices (N = 1,515)	Weighted mean among comparison practices (N = 3,782)	Standardized differences
Expenditures (per beneficiary per month, $)						
Medicare Part A and B expenditures without enhanced payments	767.6	779.1	-0.01	760.0	773.6	-0.01

Sources: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on SSP ACO participation from CMS's master data management (MDM) data; data on participation in MAPCP and in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File: 2015–2016.

[a] All values in this table are reported as percentages of either beneficiaries or practices, depending on variable (multiplied by 100), except for HCC score, number of beneficiaries assigned, median household income, HRR price index, and utilization and service use measures.

[b] Chronic conditions reported in this table are those that were prevalent for greater than 10 percent of beneficiaries in CPC+ or the comparison group in the potential opioid overuse analysis, plus Alzheimer's disease/dementia.

[c] The HCC score in the baseline year is based on beneficiaries' diagnoses in 2015. HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

[d] Practice is defined as a physical location or practice site.

[e] We define prior transformation experience as CPC Classic or MAPCP participation, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status (whether practice is in a medical home). Data from 2016 on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources. Data from 2016 on participation in MAPCP and in CPC Classic from CMS.

[f] Practice with at least one practitioner who attested to meaningful use of EHR; year of first attestation of meaningful use of EHR.

[g] Data on practice size and ownership from 2016 SK&A data.

[h] We define multispecialty as having at least one practitioner, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[i] The urbanicity of a practice's county (rural, urban, suburban) is derived from the 2013 (latest year available) rural-urban continuum codes (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/) available in the ARF.

[j] Due to lags in the ARF data, the specific year of each geographic characteristic may differ depending on the most recent year of data available. For determining whether a practice was located in a health professionals shortage area, we used data from years 2015 and 2016. For median household income, percentage of population in poverty, and Medicare Advantage penetration rate in the practice's county, we used data from 2014. For hospital beds in the practice's county, we used data from 2013 and determined county population (for creating the per 10,000 population measure of hospital beds) using 2014 data. For percentage of adults 25 or older with a degree from a four-year college, we used data from years 2010–2014.

[k] For ease of presentation, we show balance on the four Census Bureau-designated regions (based on the state of the practice) in this table. However, for inclusion in the propensity score matching model, we identified comparison market areas for each CPC+ region (or groups of regions) based on geographic proximity, the primary care landscape, and number of available potential comparison practices.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = Accountable Care Organization; ARF = Area Resource File; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; FFS = fee-for-service; HCC = Hierarchical Condition Category; HHA = home health agency; HRR = hospital referral region; MAPCP = Multi-Payer Advanced Primary Care Practice; NCQA = National Committee for Quality Assurance; QPP = Quality Payment Program; SNF = skilled nursing facility; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.H.4. Baseline characteristics (2016) for CPC+ and comparison groups in the potential opioid overuse analysis sample, by track[a]

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,355)	Weighted mean among comparison practices (N = 5,157)	Standardized differences	Mean among CPC+ practices (N = 1,500)	Weighted mean among comparison practices (N = 3,733)	Standardized differences
Potential opioid overuse	**19.3**	**18.2**	**0.03**	**19.6**	**19.2**	**0.01**
Beneficiary characteristics						
Demographics						
Age						
18–64	43.5	43.6	0.00	42.8	43.8	-0.02
65–74	32.9	32.1	0.02	33.3	31.9	0.03
75–84	16.4	16.5	0.00	16.4	16.4	0.00
85+	7.2	7.8	-0.02	7.5	7.9	-0.01
Race						
White	87.0	88.3	-0.04	87.3	88.6	-0.04
Black	8.8	7.8	0.04	8.6	7.8	0.03
All other/unknown	4.2	3.9	0.01	4.1	3.7	0.02
Male	34.9	34.6	0.01	34.1	34.5	-0.01
Eligibility for Medicare and Medicaid						
Original reason for Medicare eligibility						
Disability	58.0	57.8	0.01	57.1	57.6	-0.01
Age	41.0	41.3	-0.01	42.1	41.4	0.01
ESRD	0.9	1.0	0.00	0.9	1.0	-0.02
Dual eligibility	40.7	44.3	-0.07	39.6	43.6	-0.08
Presence of chronic conditions[b]						
Chronic obstructive pulmonary disease	25.3	25.1	0.01	23.9	24.1	0.00
Vascular disease, with or without complications	19.3	19.4	0.00	18.7	19.7	-0.03
Diabetes with chronic complications	18.2	18.2	0.00	18.7	18.1	0.01
Rheumatoid arthritis and inflammatory connective tissue disease or disorders of immunity	18.1	16.7	0.04	17.7	16.5	0.03
Schizophrenia, major depressive, bipolar, or paranoid disorders	17.3	18.9	-0.04	18.4	19.7	-0.03
Congestive heart failure	15.3	15.1	0.00	15.1	15.0	0.00
Diabetes without complication	14.1	14.2	0.00	13.0	13.7	-0.02
Specified heart arrhythmias	13.0	12.9	0.00	13.1	13.5	-0.01
Morbid obesity	11.1	11.1	0.00	11.1	11.2	0.00
Drug/alcohol psychosis or dependence	10.1	10.1	0.00	10.5	10.6	0.00
Alzheimer's disease or dementia	7.6	7.9	-0.01	7.9	7.8	0.00

Table 5.H.4 (*continued*)

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,355)	Weighted mean among comparison practices (N = 5,157)	Standardized differences	Mean among CPC+ practices (N = 1,500)	Weighted mean among comparison practices (N = 3,733)	Standardized differences
Risk score[c]						
Mean HCC score	1.6	1.6	-0.01	1.6	1.6	-0.03
Beneficiaries assigned a new enrollee HCC score (i.e., HCC score was calculated based on of demographic characteristics only)	5.1	4.8	0.01	5.5	4.9	0.03
High-risk beneficiary – 75th percentile	41.0	41.6	-0.01	40.6	41.8	-0.02
High-risk beneficiary – 90th percentile	22.8	23.3	-0.01	22.6	23.6	-0.03
Characteristics of the beneficiary's assigned practice[d]						
Prior transformation						
Experience in selected practice transformation activities[e]	53.0	52.8	0.00	81.0	76.4	***0.12***
Participant in SSP ACO as of January 1 of the first intervention year	49.7	47.8	0.04	39.9	40.3	-0.01
Meaningful EHR use[f]						
Never attested	12.0	11.6	0.01	5.7	5.6	0.01
Attested since 2011 or 2012	74.1	74.5	-0.01	84.5	85.1	-0.02
Attested since 2013 or later	13.8	13.9	0.00	9.7	9.3	0.01
Size						
Number of primary care practitioners[g]	6.6	6.6	0.00	9.1	9.0	0.01
One to two	21.0	23.4	-0.06	13.8	15.2	-0.04
Three to five	33.7	36.1	-0.05	33.3	34.8	-0.03
Six or more	45.4	40.4	0.10	52.9	50.0	0.06
Practice size category[g]						
Small (1 to 2 practitioners)	20.3	22.6	-0.06	13.2	14.5	-0.04
Medium (3 to 24 practitioners)	74.2	72.7	0.03	77.3	77.8	-0.01
Large (25 or more practitioners)	5.5	4.7	0.03	9.5	7.7	0.06
Number of Medicare beneficiaries assigned in the baseline year	1,111	1,061	0.05	1,342	1,205	***0.11***
Ownership[g]						
Hospital ownership or health system management or ownership	56.6	55.2	0.03	61.4	60.0	0.03
Hospital-owned	30.5	30.8	-0.01	29.6	33.0	-0.07
Multispecialty[h]						
Multispecialty practice	18.6	20.2	-0.04	25.8	24.2	0.04
Urbanicity of practice's county (Area Resource File)[i]						
Urban	64.3	64.3	0.00	70.6	70.1	0.01
Suburban	22.5	22.2	0.01	19.6	19.2	0.01

Table 5.H.4 (*continued*)

	Track 1			Track 2		
	Mean among CPC+ practices (N = 1,355)	Weighted mean among comparison practices (N = 5,157)	Standardized differences	Mean among CPC+ practices (N = 1,500)	Weighted mean among comparison practices (N = 3,733)	Standardized differences
Rural	13.2	13.6	-0.01	9.8	10.7	-0.03
Practice county socioeconomic characteristics (Area Resource File)[j]						
Median household income ($)	53,431	54,467	-0.08	53,862	54,681	-0.06
Medicare Advantage penetration rate	29.4	28.6	0.07	31.1	30.7	0.03
Percentage of adults 25 or older with a degree from a four-year college	28.8	28.5	0.03	29.1	29.1	0.01
Percentage of population in poverty	15.2	14.6	***0.12***	15.0	14.7	0.06
Area with a shortage of (primary care) health professionals	1.7	1.6	0.01	1.4	1.6	-0.02
Hospital beds in county per 10,000 population (Area Resource File)[j]						
1st quartile (fewest beds)	22.9	24.4	-0.04	27.8	26.3	0.03
2nd quartile	23.4	23.7	-0.01	20.7	21.3	-0.02
3rd quartile	24.7	24.0	0.02	22.5	22.8	-0.01
4th quartile (most beds)	29.0	27.9	0.02	29.0	29.6	-0.01
U.S. census region[k]						
Northeast	17.6	21.8	***-0.11***	18.4	23.3	***-0.13***
Midwest	44.7	36.5	***0.16***	34.3	34.1	0.00
South	20.8	25.0	-0.10	29.0	25.5	0.08
West	17.0	16.6	0.01	18.3	17.1	0.03
Other characteristics						
HRR price index (CMS's Medicare Geographic Variation data, 2015)	1.03	1.04	-0.06	1.03	1.04	-0.09
Service use and expenditures						
Service use (in the baseline year per 1,000 beneficiaries, annualized)						
Acute care hospitalizations	476	480	0.00	487	484	0.01
Outpatient ED visits	1,031	1,062	-0.01	1,010	1,023	0.01
Expenditures (per beneficiary per month, $)						
Medicare Part A and B expenditures without fees	1,268	1,285	-0.01	1,288	1,301	-0.01

Sources: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on SSP ACO participation from CMS's master data management (MDM) data; data on participation in MAPCP and in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File: 2015–2016.

[a] All values in this table are reported as percentages of either beneficiaries or practices, depending on variable (multiplied by 100), except for HCC score, number of beneficiaries assigned, median household income, HRR price index, service use, and expenditures.

[b] Chronic conditions that were prevalent for greater than 10 percent of any of the samples (Track 1, Track 2) and Alzheimer's disease/dementia are reported in this table.

Table 5.H.4 (*continued*)

[c] The HCC score in the baseline year is based on beneficiaries' diagnoses in 2015. HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

[e] Practice is defined as a physical location or practice site.

[e] We define prior transformation experience as CPC Classic or MAPCP participation, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status (whether practice is in a medical home). Data from 2016 on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources. Data from 2016 on participation in MAPCP and in CPC Classic from CMS.

[f] Practice with at least one practitioner who attested to meaningful use of EHR; year of first attestation of meaningful use of EHR.

[g] Data on practice size and ownership from 2016 SK&A data.

[h] We define multispecialty as having at least one practitioner, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[i] The urbanicity of a practice's county (rural, urban, suburban) is derived from the 2013 (latest year available) rural-urban continuum codes (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/) available in the ARF.

[j] Due to lags in the ARF data, the specific year of each geographic characteristic may differ depending on the most recent year of data available. For determining whether a practice was located in a health professionals shortage area, we used data from years 2015 and 2016. For median household income, percentage of population in poverty, and Medicare Advantage penetration rate in the practice's county, we used data from 2014. For hospital beds in the practice's county, we used data from 2013 and determined county population (for creating the per 10,000 population measure of hospital beds) using 2014 data. For percentage of adults 25 or older with a degree from a four-year college, we used data from years 2010–2014.

[k] For ease of presentation, we show balance on the four Census Bureau-designated regions (based on the state of the practice) in this table. However, for inclusion in the propensity score matching model, we identified comparison market areas for each CPC+ region (or groups of regions) based on geographic proximity, the primary care landscape, and number of available potential comparison practices.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = Accountable Care Organization; ARF = Area Resource File; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; FFS = fee-for-service; HCC = Hierarchical Condition Category; HHA = home health agency; HRR = hospital referral region; MAPCP = Multi-Payer Advanced Primary Care Practice; NCQA = National Committee for Quality Assurance; QPP = Quality Payment Program; SNF = skilled nursing facility; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

D. Statistical analysis

We used a difference-in-differences framework and compared (a) the changes in mean potential opioid overuse and any long-term opioid use for Medicare beneficiaries in CPC+ practices between 2016 (baseline) and the first four years of CPC+ with (b) changes among beneficiaries in the comparison practices over the same period. We estimated impacts separately by track, reflecting the differences in care delivery requirements and payments. In secondary analyses within each track, we estimated impacts for two practice subgroups: (1) those that participated in the SSP at baseline and (2) those that did not. For each track, we also tested whether overall estimated impacts differ for beneficiaries with disabilities versus those without disabilities and for beneficiaries who are dually eligible versus those who are not.

Difference-in-differences model. To estimate the cumulative impact of CPC+ over the four intervention years, we used a single intervention indicator for the four years combined. The year immediately preceding the start of CPC+ (2016) was the reference category, or baseline year, for obtaining the difference-in-differences impact estimates. The impact estimate is based on the CPC+ and comparison group difference in an outcome in the intervention period minus the average CPC+ and comparison group difference in that outcome in the baseline year. We estimated separate regression models for each outcome of interest. Our main estimation approach is shown in Equation 5.H.1.

$$Y_{ijt} = \alpha + \beta X_{it} + \delta C \cdot Year_{t=2020} + \vartheta SVI_t + \tau S_t + \mu P_j + \gamma \cdot Post_t + \theta Treatment_j \cdot Post_t + \varepsilon_{ijt} \quad \text{(5.H.1)}$$

where

Y_{ijt} = outcome variable for beneficiary *i*, in practice *j*, in year *t*.

Four sets of control variables included:

- X_{it} = vector of beneficiary-level controls measured at the start of the baseline period and the start of the intervention period; see section below on control variables.
- C = vector of control variables that measure the intensity of the COVID-19 epidemic and the government response and are interacted with a year indicator for 2020.
- SVI_t = social vulnerability index; see section below on control variables.
- S_t = two sets of variables that address state opioid policies: (1) sophistication of PDMPs for 2016, 2018, and 2020 and (2) value of federal opioid funding awarded to each state for 2016, 2017, and 2018. See section below on control variables.
- P_j = fixed effects for practice *j* that controls for all time-invariant practice characteristics.
- $Post_t$ = binary indicator for whether year *t* is in the intervention period versus the pre-intervention year.

- $Treatment_j$ = binary indicator of treatment status, that is, of being attributed to a CPC+ practice.
- ε_{ijt} = the idiosyncratic error term.

The difference-in-differences impact estimate over the four-year intervention period is θ. Note that the treatment indicator is collinear with the practice fixed effects; therefore, the difference between CPC+ and comparison practices at baseline, or the main effect of treatment status, cannot be estimated. However, the model can estimate the interaction term between treatment and *Post*, that is, the difference-in-differences estimate over the entire intervention period. We estimated a similar model for each intervention year, by interacting the treatment dummy with each intervention year. We estimated all models using ordinary least squares.

- **Control variables.** To account for small differences between CPC+ and the comparison group that remained after matching, and to improve the precision of our estimates, the linear regression models controlled for beneficiary characteristics, practice fixed effects, changes in state opioid policies, and intensity of COVID-19 over time.
- **Beneficiary characteristics.** For observations in the intervention period, beneficiary-level control variables were measured directly before the start of CPC+ (that is, based on data from calendar year 2016). For observations in the baseline period, beneficiary-level control variables were measured directly before the start of the yearlong baseline period (based on data from calendar year 2015). For comprehensive risk adjustment, in addition to the Hierarchical Condition Category (HCC) score, the regression includes indicators for specific chronic HCC conditions selected based on their weight in the HCC score calculation and on a high prevalence in the CPC+ sample (collapsing categories, where appropriate). To account for possible changes in the relationship between a characteristic measured at the start of the intervention and outcomes, we also included interactions between the HCC score and each intervention year from the second year onward, as well as interactions between specific chronic conditions and the intervention year (Table 5.H.5).
- **Practice fixed effects.** Practice fixed effects are indicators or dummy variables—one for each practice in the CPC+ and comparison groups. Including these effects controls for any inherent, time-invariant differences between CPC+ and comparison practices, whether such differences are observed or unobserved. Including practice fixed effects ensures that we accounted for any remaining imbalance in the practice-level variables used in matching and in any other unmeasured practice characteristics at baseline, when obtaining the difference-in-differences impact estimates. We did not incorporate changes over time in observed practice characteristics as control variables because CPC+ might affect practice characteristics.
- **Changes in state opioid policies.** Because matched comparison practices are generally located in different states than CPC+ practices, it is possible that the estimated effect of CPC+ on potential opioid overuse is due to differential changes in state-level opioid policies and practices over time between CPC+ and comparison groups. To control for this potential confounding, the regression models included:

  - An index of PDMP characteristics that captures the sophistication of the PDMP, with characteristics measured in 2016, 2018, and 2020. We created a simple index of PDMP characteristics, listed in Table 5.H.6, giving each characteristic an equal weight. To decide which characteristics to include in the index, we relied on the literature that has used such characteristics in similar contexts and also used expert opinion. For example, sophistication of PDMPs, measured using criteria similar to that in our index, has been found to be associated with reductions in prescribing of opioids and reductions in overdose deaths (Pardo 2017; Wen et al. 2017; Buchmueller and Carey 2018). After examining an initial list of PDMP characteristics, we retained only those characteristics that change over time because practice fixed effects already capture all time-invariant characteristics. We capture PDMP characteristics in every other year (2016, 2018, and 2020) because it was less resource intensive to do so; further, year-to-year data showed some inconsistencies in measurement. For 2017 and 2019, PDMP variables were set to the previous year's value.
  - The amount of federal opioid-related grant funding per capita awarded to states in 2016, 2017, and 2018 (Table 5.H.6). These grants provide funding for opioid programs and interventions as well as interventions to address substance use disorder with an opioid-related component. Grants that spanned several years were attributed to the first year of the award (Katcher and Ruhm 2021). Data on federal opioid funding in 2019 and 2020 were not available at the time of this analysis. State funding variables were coded as zero for the years with missing data. To distinguish true zeros from these zeroes that indicate missingness, we included a missing indicator in the regression, equal to one when the opioid policy variables are missing and zero otherwise.

- **COVID-19 controls.** Because the CPC+ impact evaluation relies on comparison practices selected from external regions, the timing and severity of the COVID-19 pandemic differed considerably by region during 2020, and the outcomes in 2020 may be affected by COVID-19, we were concerned that COVID-19 could introduce bias into the analysis. To reduce the potential bias due to any differences in the effect of COVID-19 on CPC+ versus comparison practices' outcomes, we included four control variables. First, we used a state–hospital referral region (HRR)-level measure of excess deaths for all Medicare FFS beneficiaries in CPC+ and comparison regions for each wave of the pandemic in 2020. (We defined waves as follows: wave 1: March–May; wave 2: June–September; wave 3: October–December.) We created the excess deaths measure by following the methods in Polyakova et al. (2021). Second, we used a publicly available social vulnerability index at the census tract level.[127] Third, we used a publicly available pandemic vulnerability index at the county level, calculated for each wave.[128] Fourth, we used a publicly available state government response index at the state-year level.[129]

[127] See https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

[128] See https://www.niehs.nih.gov/research/programs/coronavirus/covid19pvi/details/index.cfm.

[129] See https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker.

Table 5.H.5. Beneficiary-level control variables for the difference-in-differences regressions

Baseline characteristic category	Variables[a]
Demographics	Age categories < 65 65–74 (reference category) 75–84 ≥ 85 Race categories White (reference category) Black All other/unknown Gender (binary indicator for male)
Original reason for Medicare eligibility	Original Medicare eligibility categories Age (reference category) Disability only ESRD only or ESRD with disability
Dual eligibility	Indicator for dual status (where dual is defined as those with full or partial Medicaid benefits according to Master Beneficiary Summary File)

Table 5.H.5 (*continued*)

Baseline characteristic category	Variables[a]
Chronic conditions	HCCs:[b] HCC 18 – Diabetes with Chronic Complications HCC 19 – Diabetes without Complications HCC 21 – Protein-Calorie Malnutrition HCC 22 – Morbid Obesity HCC 23 – Other Significant Endocrine and Metabolic Disorders HCC84 – Cardio-Respiratory Failure and Shock HCC 85 – Congestive Heart Failure HCC 96 – Specified Heart Arrhythmias HCC 106 – Atherosclerosis of the Extremities with Ulceration or Gangrene HCC 111 – Chronic Obstructive Pulmonary Disease HCC 135 – Acute Renal Failure HCC 138 – Chronic Kidney Disease, Moderate (Stage 3) HCC 173 – Traumatic Amputations and Complications HCC 40 or 47 – Rheumatoid Arthritis and Inflammatory Connective Tissue Disease or Disorders of Immunity HCC 46 or 48 – Severe Hematological Disorders, or Coagulation Defects and Other Specified Hematological Disorders HCC 57 or 58 – Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders HCC 70 or 71 – Quadriplegia or Paraplegia HCC 80 or 82 – Coma, Brain Compression/Anoxic Damage or Respirator Dependence/Tracheostomy Status HCC 86, 87, or 88 – Acute Myocardial Infarction, Unstable Angina and Other Acute Ischemic Heart Disease, or Angina Pectoris HCC 99 or 100 – Cerebral Hemorrhage, or Ischemic or Unspecified Stroke HCC 107 or 108 – Vascular Disease, with Complications HCC 157 or 158 – Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone; or of Skin with Full Thickness Skin Loss HCC 8, 9, 10, 11, or 12 – Metastatic Cancer and Acute Leukemia; Lung and Other Severe Cancers; Lymphoma and Other Cancers; Colorectal, Bladder, and Other Cancer; or Breast, Prostate, and Other Cancers and Tumors Chronic Conditions Warehouse indicator: Alzheimer's disease or dementia Chronic condition indicators interacted with follow-up year from second follow-up year onward
Risk score	HCC score Indicator for whether HCC score was assigned a new enrollee HCC score (i.e., HCC score was calculated based on of demographic characteristics only) HCC score interacted with follow-up year from second follow-up year onward Indicator for being assigned a new enrollee HCC score interacted with follow-up year from second follow-up year onward

[a] Beneficiary-level control variables were measured either directly before the start of CPC+ (for the intervention period observations) or directly before the start of the yearlong baseline period (for the baseline-period observations). The yearlong baseline period is 2016.

[b] We selected a subset of the 79 HCCs—created by the HCC model for inclusion as control variables, based on the relative weight of specific HCCs in HCC score calculation as well as their prevalence in our analysis sample. We also included an indicator for Alzheimer's disease or dementia from the Chronic Conditions Warehouse (because there is not an HCC for Alzheimer's disease or dementia).

CPC+ = Comprehensive Primary Care Plus Initiative; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category.

Table 5.H.6. State opioid policy controls for the difference-in-differences regressions

State opioid policy category	Components/description	Data source
Index for sophistication of PDMPs, components are equally weighted	Simple index (each component receives an equal weight) measured in 2016, 2018, and 2020 using the following components: Uses a vendor Integrated with electronic health records (EHRs) Integrated with pharmacy databases Enrollment is mandatory for prescribers Use is mandatory for prescribers Enrollment is mandatory for dispensers Use is mandatory for dispensers Reports available to prescribers Data collection frequency: real-time, daily, or next business day Data sharing: share data with 21 states or more	PDMP TTAC 2021
State-level federal opioid-related funding	Amount of federal grants awarded in fiscal years 2016, 2017, and 2018	Katcher and Ruhm (2021)

PDMP = prescription drug monitoring program; TTAC = Training and Technical Assistance Center.

Weighting. We applied weights to the observations in the regressions to ensure that the CPC+ and comparison groups were comparable. The regression weight equaled the covariate-balancing propensity score-based weights used to balance the CPC+ and comparison practices on their baseline characteristics. As is typical for propensity score weighting, we set the weights for the intervention practices at 1, meaning that each intervention practice would count equally in practice-level analysis and each intervention beneficiary would count equally in beneficiary-level analysis. To achieve better balance between the intervention and comparison practices, the comparison practice weights varied based on the practice's similarity to the intervention group practices (Kranker et al. 2020).

Adjusting for clustering. Standard errors were adjusted for clustering at the practice level, accounting for correlation in an outcome across beneficiaries assigned to the same practice—both within and across time periods.

All *p*-values were two-sided and considered statistically significant if $p < 0.05$. We did not adjust for multiple comparisons, but instead we examined the consistency of the magnitude and statistical significance of the estimates and the patterns of findings across time periods and tracks to avoid spurious conclusions. This approach is supported by the American Statistical Association's statement on statistical significance, which recommends that policy decisions should not be based entirely on whether a *p*-value passes a specific threshold and argues that *p*-values cannot entirely measure the importance of a result (Wasserstein and Lazar 2016).

5.H.3. Results

A. Descriptive analyses

A.1. Characteristics of long-term opioid users and beneficiaries who potentially overuse opioids

We conducted several descriptive analyses to understand the characteristics of beneficiaries eligible for the opioid use measures. We interpret only very large differences to avoid erroneous conclusions that can occur when relying on statistically significant differences (Amrhein et al. 2019; Harrington et al. 2019). We show these characteristics at baseline by track for beneficiaries in CPC+ practices (Table 5.H.7 and Table 5.H.8). This information for comparison beneficiaries in both tracks (data not shown) was qualitatively the same.

In both tracks, CPC+ beneficiaries who used opioids long term in 2016 were over three times as likely to be under 65 years old, over twice as likely to be dually eligible for Medicare and Medicaid, and about three times as likely to have a disability (to be eligible for Medicare based on having a disability) relative to CPC+ beneficiaries who did not use opioids long term. Long-term opioid users had a greater prevalence of chronic conditions based on diagnoses recorded in claims data, and much higher Medicare service utilization: they were over twice as likely to have chronic obstructive pulmonary disease (COPD) and rheumatoid arthritis, six times more likely to have diagnoses for drug/alcohol psychosis or dependence and had twice the ED visit rate and roughly 30 percent higher Medicare spending. Further, beneficiaries who use opioids long-term (versus those who do not) are less likely to live in the Northeast (Tables 5.H.7 and 5.H.8).

We also compared beneficiaries who potentially overuse opioids to those who use opioids long-term but do not overuse them. Beneficiaries who potentially overuse opioids were roughly 65 percent more likely to be under 65 years old, about 50 percent more likely to have a disability, and over twice as likely to have a diagnosis for drug/alcohol psychosis or dependence than those who do not overuse opioids. Beneficiaries who potentially overuse opioids also had roughly 20 percent higher hospitalization rates than those who do not (Tables 5.H.7 and 5.H.8).

Using baseline characteristics, we also examined changes in sample composition over time for (1) long-term opioid users and (2) beneficiaries who potentially overuse opioids, because large changes in sample composition could confound impact estimates. We did not find any large differences between 2016 and 2020 for CPC+ or comparison beneficiaries for either outcome and in either track (Figure 5.H.1 and Figure 5.H.2). Observing similar changes in sample composition for CPC+ and comparison groups over time gives confidence that estimated impacts are not driven by compositional differences between baseline and follow-up.

Table 5.H.7. Key baseline characteristics (2016) for CPC+ beneficiaries by whether they use opioids long term or potentially overuse them, Track 1[a]

	Not using long term (N=570,659)	Using long term (N=40,219)	Using long term, but not at a high dosage (N=32,479)	Potentially overusing (N=7,743)
Key beneficiary characteristics				
Demographics				
Age				
18–64	12.1	43.5	38.6	64.0
65–74	49.1	32.9	34.7	25.5
75–84	26.8	16.4	18.4	8.0
85 +	12.0	7.2	8.4	2.5
Race				
White	88.8	87.0	86.8	87.7
Black	5.3	8.8	9.0	7.7
All other/unknown	5.9	4.2	4.1	4.6
Male	40.6	34.9	33.4	41.3
Eligibility for Medicare and Medicaid				
Original reason for Medicare eligibility				
Age	81.2	41.0	46.0	20.4
Disability	18.4	58.0	53.1	78.8
ESRD	0.5	0.9	0.9	0.8
Dual eligibility	15.2	40.7	39.5	45.8
Presence of chronic conditions[b]				
Vascular disease, with or without complications	16.1	19.3	19.7	17.8
Chronic obstructive pulmonary disease	12.2	25.3	24.8	27.7
Diabetes with chronic complications	12.5	18.2	18.5	17.2
Congestive heart failure	10.9	15.3	15.6	13.8
Schizophrenia, major depressive, bipolar, or paranoid disorders	7.5	17.3	16.3	21.5
Rheumatoid arthritis or disorders of immunity	7.1	18.1	17.3	21.4
Drug/alcohol psychosis or dependence	1.7	10.1	8.1	18.5
Risk score[c]				
Mean HCC score	1.2	1.6	1.6	1.7
Service use and expenditures				
Service use (in the baseline year per 1,000 beneficiaries, annualized)				
Acute care hospitalizations	341	476	458	553
Outpatient ED visits	499	1,031	1,018	1,086
Expenditures (per beneficiary per month, $)				
Medicare Part A and B expenditures without fees	1,002	1,268	1,236	1,402
Key characteristics of the beneficiary's assigned practice				
Urbanicity of practice's county (Area Resource File)[d]				
Urban	72.3	64.3	62.7	70.7
Suburban	17.9	22.5	23.3	19.0
Rural	9.7	13.2	13.9	10.3

Table 5.H.7 (*continued*)

	Not using long term (N=570,659)	Using long term (N=40,219)	Using long term, but not at a high dosage (N=32,479)	Potentially overusing (N=7,743)
U.S. Census Region[e]				
Northeast	31.3	17.6	16.0	24.1
Midwest	37.9	44.7	46.2	38.1
South	14.1	20.8	21.6	17.5
West	16.7	17.0	16.2	20.3

Source: Medicare Enrollment Database and claims data for 2014 through 2016.

[a] All values in this table are reported as percentages (multiplied by 100), except for HCC score, service use, and expenditure measures.

[b] Chronic conditions that were prevalent for greater than 15 percent in any of the four samples (not using long term; using long term; using long term, but not at high dosage; potentially overusing) are reported in this table.

[c] The HCC score in the baseline year is based on beneficiaries' diagnoses in 2015. HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

[d] The urbanicity of a practice's county (rural, urban, suburban) is derived from the 2013 (latest year available) rural-urban continuum codes (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/) available in the ARF.

[e] We show the proportion of practices located in each of the four U.S. Census regions.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category.

Table 5.H.8. Key baseline characteristics (2016) for CPC+ beneficiaries by whether they use opioids long term or potentially overuse them, Track 2[a]

	Not using long term (N=690,590)	Using long term (N=48,747)	Using long term, but not at high dosage (N=39,216)	Potentially overusing (N=9,531)
Key beneficiary characteristics				
Demographics				
Age				
18–64	12.1	42.8	37.7	63.6
65–74	49.4	33.3	35.2	25.8
75–84	26.6	16.4	18.4	7.9
85 +	11.9	7.5	8.7	2.8
Race				
White	87.9	87.3	87.3	87.3
Black	5.9	8.6	8.7	8.0
All other/unknown	6.2	4.1	3.9	4.7
Male	41.0	34.1	32.5	41.0
Eligibility for Medicare and Medicaid				
Original reason for Medicare eligibility				
Age	81.3	42.1	47.3	20.6
Disability	18.3	57.1	51.8	78.6
ESRD	0.5	0.9	0.9	0.8
Dual eligibility	15.1	39.6	37.8	47.2
Presence of chronic conditions[b]				
Vascular disease, with or without complications	15.9	18.7	19.0	17.5
Chronic obstructive pulmonary disease	11.6	23.9	23.4	25.8
Diabetes with chronic complications	12.9	18.7	18.9	17.8
Congestive heart failure	10.8	15.1	15.3	14.2
Schizophrenia or major depressive, bipolar, or paranoid disorders	7.9	18.4	17.4	22.5
Rheumatoid arthritis and inflammatory connective tissue disease or immunity disorders	6.8	17.7	17.0	20.8
Drug/alcohol psychosis or dependence	1.7	10.5	8.5	19.1
Risk score[c]				
Mean HCC score	1.2	1.6	1.5	1.7
Service use and expenditures				
Service use (in the baseline year, per 1,000 beneficiaries, annualized)				
Acute care hospitalizations	341	487	469	558
Outpatient ED visits	497	1,010	976	1,146
Expenditures (per beneficiary per month, US$)				
Medicare Part A and B expenditures without fees	991	1,288	1,258	1,411
Key characteristics of the beneficiary's assigned practice				
Urbanicity of practice's county (Area Resource File)[d]				
Urban	77.0	70.6	69.8	73.5
Suburban	15.5	19.6	20.1	17.6
Rural	7.5	9.8	10.1	8.8

Table 5.H.8 (*continued*)

	Not using long term (N=690,590)	Using long term (N=48,747)	Using long term, but not at high dosage (N=39,216)	Potentially overusing (N=9,531)
U.S. Census Region[e]				
Northeast	29.5	18.4	16.6	25.7
Midwest	35.0	34.3	36.3	26.2
South	17.8	29.0	29.5	27.2
West	17.7	18.3	17.7	20.8

Source: Medicare Enrollment Database and claims data for 2014 through 2016.

[a] All values in this table are reported as percentages (multiplied by 100), except for HCC score, service use, and expenditure measures.

[b] Chronic conditions that were prevalent for greater than 10 percent of any of the sample categories (not using long term; using long term; using long term, but not at high dosage; potentially overusing) and Alzheimer's disease/dementia are reported in this table.

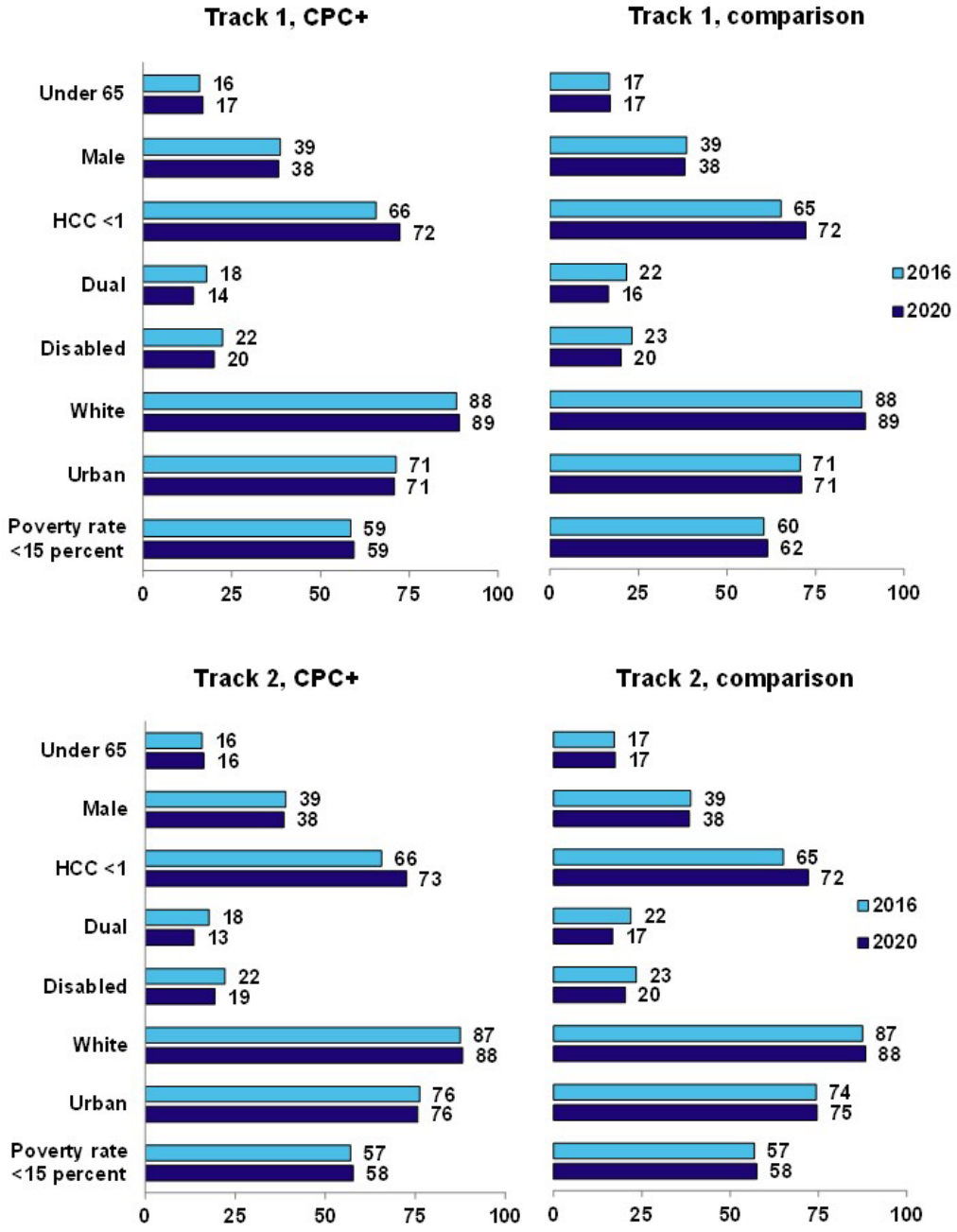
[c] The HCC score in the baseline year is based on beneficiaries' diagnoses in 2015. HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

[d] The urbanicity of a practice's county (rural, urban, suburban) is derived from the 2013 (latest year available) rural-urban continuum codes (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/) available in the ARF.

[e] We show the proportion of practices located in each of the four U.S. Census regions.

CPC+ = Comprehensive Primary Care Plus; ED = emergency department; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category.

Figure 5.H.1. Changes between 2016 and 2020 in the sample of beneficiaries eligible for the long-term use analysis, by track and CPC+ versus comparison status

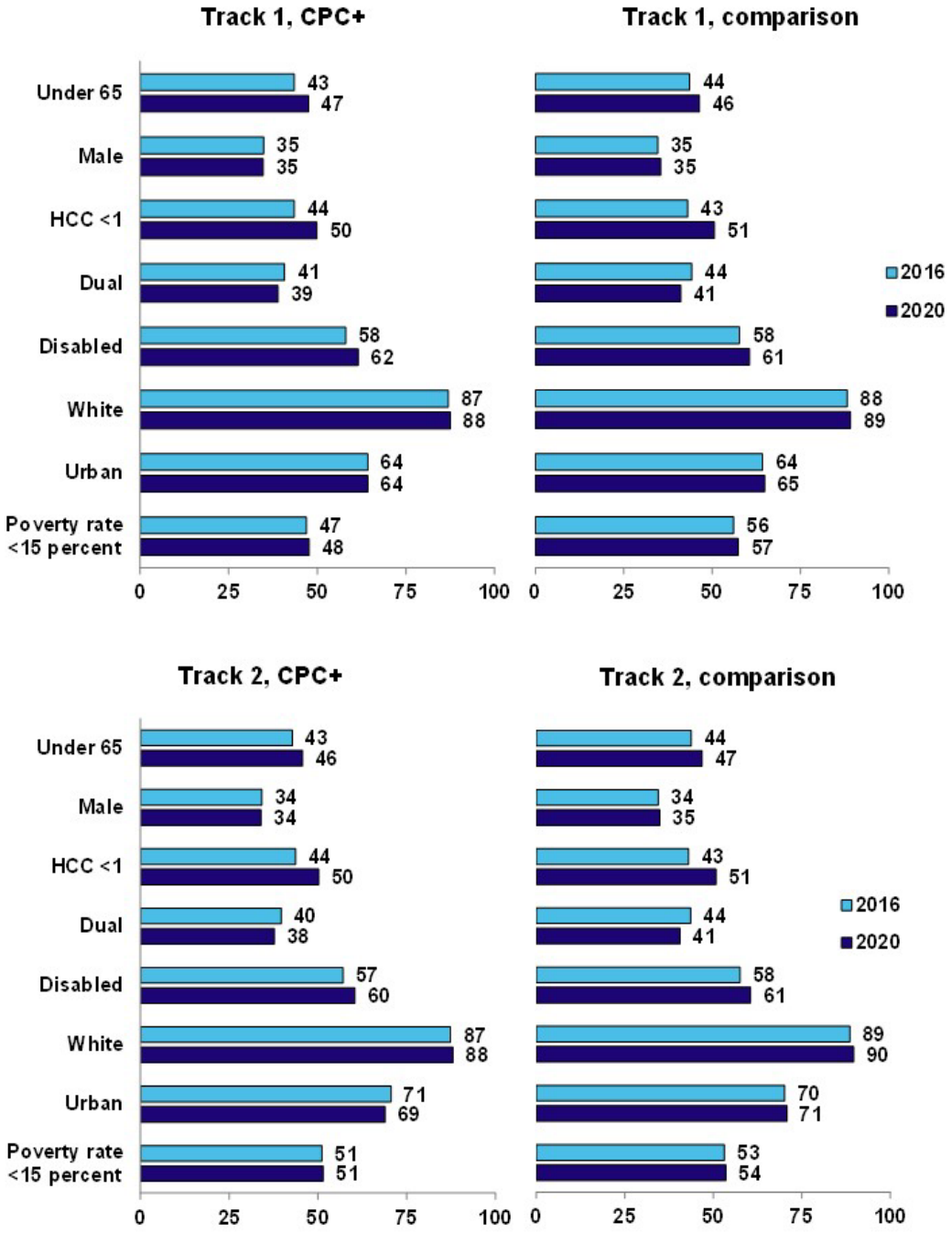


Source: Mathematica's analysis of Medicare claims data and Medicare Enrollment Database from January 2013 through December 2020 and county data from the Area Resource File: 2015–2016.

Notes: All values in this figure are reported as percentages (multiplied by 100). For poverty rate, we reported the proportion of beneficiaries who live in counties with poverty rate less than 15 percent, which is roughly the mean in 2016 among the CPC+ beneficiaries in both tracks.

CPC+ = Comprehensive Primary Care Plus; HCC = hierarchical condition category.

Figure 5.H.2. Changes between 2016 and 2020 in the sample of beneficiaries eligible for the potential overuse analysis, by track and CPC+ versus comparison status



Source: Mathematica's analysis of Medicare claims data and Medicare Enrollment Database from January 2013 through December 2020 and county data from the Area Resource File: 2015–2016.

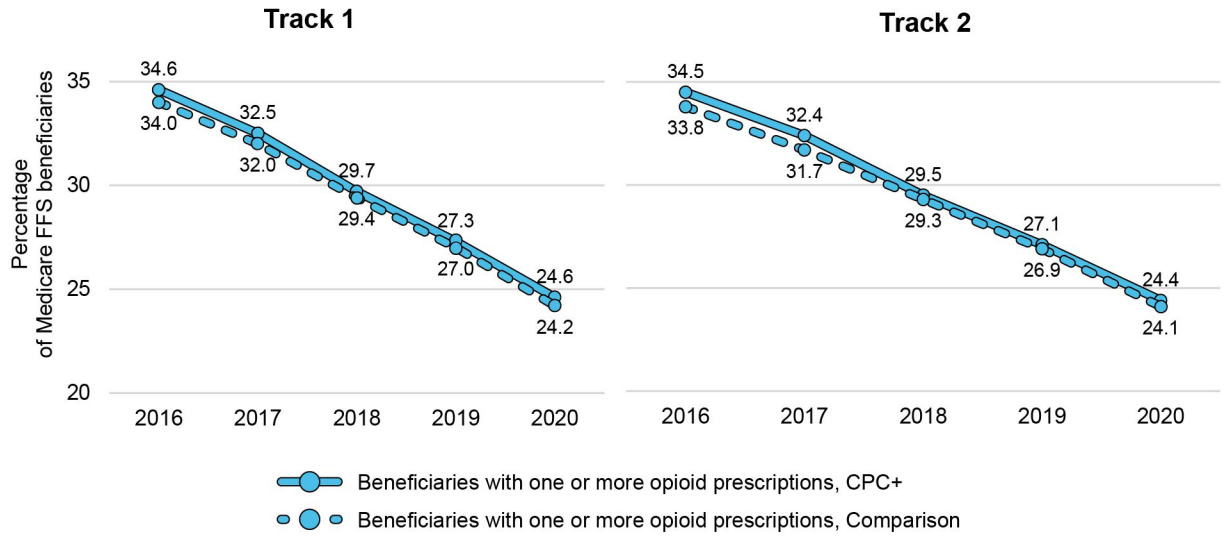
Notes: All values in this figure are reported as percentages (multiplied by 100). For poverty rate, we reported the proportion of beneficiaries who live in counties with poverty rate less than 15 percent, which is roughly the mean in 2016 among the CPC+ beneficiaries in both tracks.

CPC+ = Comprehensive Primary Care Plus; HCC = hierarchical condition category.

A.2. Changes in any opioid use over time

Among the continuously enrolled Medicare FFS beneficiaries attributed to the CPC+ and comparison practices, the proportion of beneficiaries with any opioid use in a year decreased by 10 percentage points (from roughly 34 to 24 percent) between 2016 and 2020 (Figure 5.H.3). Figure 5.H.3 displays means that were weighted to ensure similarity of CPC+ and comparison groups at baseline. These means are not regression-adjusted because our goal was not to estimate impacts on any opioid use.

Figure 5.H.3. Change in unadjusted means in any opioid use between 2016 and 2020, by track and CPC+ versus comparison status



Source: Mathematica's analysis of Medicare claims data from January 2014 through December 2020.

Notes: This figure shows means for any opioid use, weighted to account for differences between CPC+ and comparison groups at baseline, but not regression-adjusted.

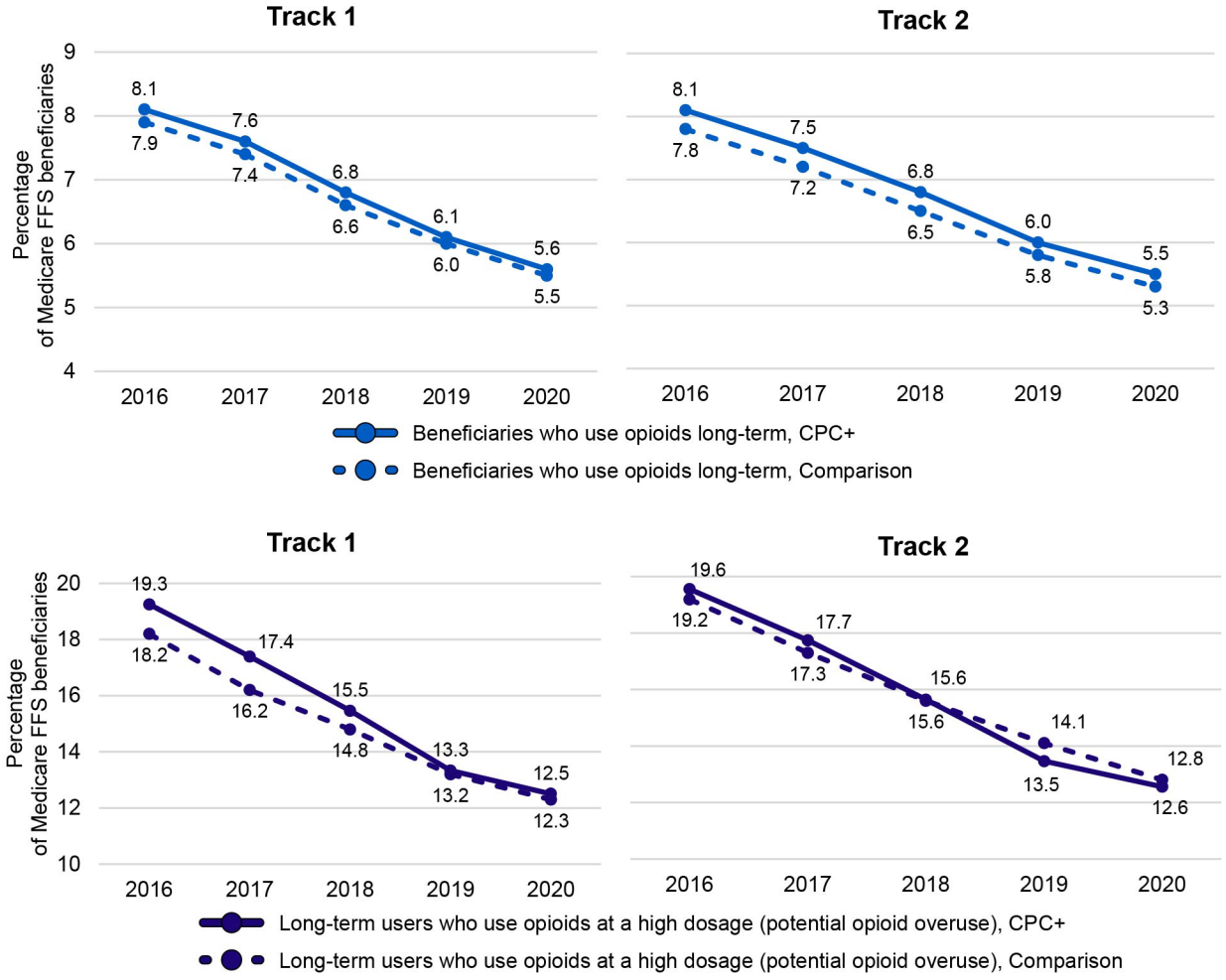
CPC+ = Comprehensive Primary Care Plus.

B. The effect of CPC+ on long-term use of opioids and potential opioid overuse

B.1. Change in regression-adjusted means over time

Based on the difference-in-differences estimation, we computed regression-adjusted means of long-term use and potential opioid overuse between 2016 and 2020 for CPC+ and comparison practices. We found that, over this period, long-term opioid use decreased from roughly 8 percent to 5.5 percent and potential opioid overuse decreased from about 19 percent to 12.5 percent. Long-term use and potential overuse started slightly higher in CPC+ practices in 2016 than in the comparison group practices and declined to more similar levels by 2020. The patterns were similar for Track 1 and Track 2 practices. Long-term opioid use and overuse also decreased during the COVID-19 pandemic, that is, between 2019 and 2020, albeit at a somewhat lower rate than in previous years (Figure 5.H.4).

Figure 5.H.4. Change in regression-adjusted means in long-term opioid use and potential overuse between 2016 and 2020, by track and CPC+ versus comparison status



Source: Mathematica's analysis of Medicare claims data from January 2014 through December 2020.

Notes: This figure shows regression-adjusted means for long-term opioid use and potential opioid overuse, weighted to account for differences between CPC+ and comparison groups at baseline.

CPC+ = Comprehensive Primary Care Plus.

B.2. Estimated impacts: overall sample

Regression-adjusted difference-in-differences estimates show larger decreases in long-term use of opioids and potential opioid overuse between baseline and Program Year (PY) 3 and PY 4 among CPC+ versus comparison practices. There was a statistically significant 0.2 percentage point greater decrease in long-term use of opioids among CPC+ versus comparison practices between baseline and PY 3 and PY 4 for Track 2 practices (*p*-values = 0.028 and 0.033). Across all four years combined, the estimate was small, favorable (0.1 percentage points) but not statistically significant. We found an estimated impact of similar magnitude in PY 4 for Track 1, but it was not statistically significant and no effect for all four years combined (Table 9).

We also found a greater decrease in potential opioid overuse among CPC+ beneficiaries relative to comparison beneficiaries between baseline and PY 3 and PY 4. Between baseline and PY 3, the proportion of beneficiaries who were overusing opioids decreased by 0.9 percentage points more among CPC+ Track 1 beneficiaries than among comparison group beneficiaries (*p*-value < 0.01). For Track 1, the estimated impact was similar in magnitude and statistical significance in PY4 (0.8 percentage points, *p*-value = 0.02). Across all four years combined, the estimate was favorable but not statistically significant. For Track 2, impact estimates were similar in magnitude in PY 3 and PY 4 as for Track 1, but not statistically significant in PY 4. For both the potential opioid overuse and the long-term opioid use outcomes, the confidence intervals for the impact estimates in the two tracks overlapped to a high degree, indicating a lack of observable difference by track (Table 5.H.10).

Results of sensitivity analyses. To test the key assumption of the difference-in-difference analyses, that is, whether the CPC+ and comparison groups were on a similar trajectory of changes in potential opioid overuse before CPC+ started, we performed a falsification test by estimating "impacts" of CPC+ in 2016, with 2015 as the baseline year. We would expect estimated impacts to be statistically indistinguishable from zero in 2016, unless CPC+ and comparison practices were experiencing differential changes in potential opioid overuse even before CPC+ started. For both long-term opioid use and potential opioid overuse in the overall sample, estimated coefficients were small and not statistically significant in both tracks, indicating that the parallel trends assumption was unlikely to be violated (Table 5.H.11).

Also, we tested whether the results were sensitive to the inclusion of the state opioid funding and PDMP characteristics and found that their exclusion did not change our findings substantively (data available upon request).

B.3. Estimated impacts: subgroups

Estimated impacts for SSP and non-SSP practices. Among Track 1 practices, SSP practices had larger reductions in long-term opioid use in PY 2 through PY 4 (0.2 to 0.5 percentage points) and across all four years combined (0.3 percentage points). Among Track 2 practices, estimated impacts on long-term opioid use were favorable in PY 3 and PY 4 among both SSP and non-SSP practices, but they were not statistically significant (Table 5.H.9). For long-term use, falsification test results showed that all groups except Track 1 non-SSP passed the falsification test. For Track 1 non-SSP, we found a 0.1 percentage point greater decrease in long-term use among CPC+ beneficiaries versus comparisons in 2016, one year before CPC+ started (*p*-value = 0.04) (Table 5.H.11). This result casts doubt on the validity of an impact analysis on long-term use in the Track 1 non-SSP group; therefore, we do not describe those impact estimates, but still report them in Table 5.H.9 for transparency.

By SSP status within each track, there were greater reductions in potential opioid overuse for CPC+ versus comparison practices in PY 3 and PY 4. This is consistent with the overall findings, with some differences in statistical significance across groups. Favorable impacts for the Track 1 SSP group occurred earlier than in other groups (starting in PY 2). For the Track 1 non-SSP and Track 2 SSP groups, there were greater reductions in potential opioid overuse in CPC+ practices than in comparison practices in PY 3 and PY 4; the impact estimates were of moderate size, but not statistically significant. For the Track 2 non-SSP group, estimated impacts were favorable and statistically significant in PY 3, but smaller and not statistically significant in PY 4. Even though estimated impacts on potential opioid overuse differed in significance by SSP status, the magnitude of the estimates was generally similar in all groups, and confidence intervals largely overlapped (Table 5.H.10). The falsification test results for potential opioid overuse showed small, statistically insignificant estimated coefficients by SSP status within each track, indicating that the parallel trends assumption was unlikely to be violated (Table 5.H.11).

Estimated impacts for beneficiary subgroups. Across all four years of CPC+, for both long-term use and potential opioid overuse, regression-adjusted difference-in-differences estimates did not show that estimated impacts differed among beneficiaries with disabilities versus those without disabilities or among dually eligible versus non-dually eligible beneficiaries. The *p*-values in the last column of Table 5.H.12 represent results from testing for statistically significant differences in impact estimates among the categories of subgroups defined at baseline. Because this test did not indicate a statistically significant or meaningful difference among any subgroups defined by the same characteristic, we did not further test whether estimates within each subgroup were statistically significant (Table 5.H.12).

Table 5.H.9. Difference-in-differences estimates of the effect of CPC+ on long-term opioid use over the first four program years, by track and by SSP status

	Overall					SSP					Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value
Track 1 results															
Baseline	8.1%	7.9%	NA	NA	NA	7.8%	7.2%	NA	NA	NA	8.5%	8.7%	NA	NA	NA
PY 1	7.6%	7.4%	0.0 (0.1)	(-0.1, 0.1)	0.540	7.2%	6.8%	-0.1* (0.1)	(-0.2, 0.0)	0.078	7.9%	8.0%	0.2** (0.1)	(0.1, 0.3)	0.017
PY 2	6.8%	6.6%	0.0 (0.1)	(-0.1, 0.1)	0.907	6.5%	6.1%	-0.2** (0.1)	(-0.3, -0.1)	0.015	7.2%	7.2%	0.3*** (0.1)	(0.1, 0.5)	0.003
PY 3	6.1%	6.0%	0.0 (0.1)	(-0.1, 0.1)	0.834	5.8%	5.5%	-0.3*** (0.1)	(-0.5, -0.1)	0.002	6.5%	6.4%	0.4*** (0.1)	(0.2, 0.6)	0.002
PY 4	5.6%	5.5%	-0.2* (0.1)	(-0.3, 0.0)	0.082	5.3%	5.2%	-0.5*** (0.1)	(-0.6, -0.3)	0.000	5.9%	5.9%	0.2 (0.1)	(0.0, 0.4)	0.111
PY 1 through PY 4	6.5%	6.3%	0.0 (0.1)	(-0.1, 0.1)	0.617	6.1%	5.9%	-0.3*** (0.1)	(-0.4, -0.1)	0.001	6.8%	6.8%	0.3** (0.1)	(0.1, 0.4)	0.007
Unweighted sample sizes[c]															
Number of beneficiaries	910,673	3,079,206				469,360	1,799,064				442,634	1,287,948			
Number of beneficiary-years	2,781,717	9,370,983				1,423,330	5,462,063				1,358,387	3,908,920			
Track 2 results															
Baseline	8.1%	7.8%	NA	NA	NA	7.3%	7.1%	NA	NA	NA	8.8%	8.3%	NA	NA	NA
PY 1	7.5%	7.2%	0.0 (0.1)	(-0.1, 0.0)	0.439	6.7%	6.7%	-0.1 (0.1)	(-0.2, 0.0)	0.101	8.1%	7.6%	0.0 (0.1)	(-0.1, 0.1)	0.678
PY 2	6.8%	6.5%	-0.1 (0.1)	(-0.2, 0.1)	0.483	6.0%	6.0%	-0.1 (0.1)	(-0.2, 0.1)	0.509	7.4%	6.9%	0.0 (0.1)	(-0.2, 0.1)	0.977
PY 3	6.0%	5.8%	-0.2** (0.1)	(-0.3, 0.0)	0.028	5.4%	5.4%	-0.2 (0.1)	(-0.4, 0.0)	0.182	6.5%	6.2%	-0.1 (0.1)	(-0.3, 0.0)	0.152
PY 4	5.5%	5.3%	-0.2** (0.1)	(-0.3, 0.0)	0.033	4.9%	4.9%	-0.2 (0.1)	(-0.4, 0.1)	0.256	6.0%	5.6%	-0.2 (0.1)	(-0.4, 0.0)	0.108
PY 1 through PY 4	6.4%	6.2%	-0.1* (0.1)	(-0.2, 0.0)	0.079	5.7%	5.7%	-0.1 (0.1)	(-0.3, 0.0)	0.196	7.0%	6.5%	-0.1 (0.1)	(-0.2, 0.1)	0.386
Unweighted sample sizes[c]															
Number of beneficiaries	1,100,836	2,604,604				496,717	1,309,576				606,187	1,301,024			
Number of beneficiary-years	3,370,002	7,949,782				1,508,144	3,996,015				1,861,858	3,953,767			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] We report the actual, unadjusted averages in the baseline period, which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

Table 5.H.9 (*continued)*

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries assigned to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and changes in state-level PDMP characteristics and opioid funding.

[c] After accounting for weights that adjust for matching, the effective sample sizes fall but are still substantial. For the comparison group, the effective sample size is 39 to 52 percent of the actual sample size. The effective sample size for the CPC+ group is 100 percent because it is not affected by the matching weights.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

NA = not applicable because the difference-in-differences impact estimate cannot be calculated at baseline.
C = comparison; FFS = fee-for-service; PDMP = prescription drug monitoring program; PY = Program Year; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.H.10. Difference-in-differences estimates of the effect of CPC+ on potential opioid overuse over the first four program years, by track and by SSP status

	Overall					SSP					Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value
Track 1 results															
Baseline	19.3%	18.2%	NA	NA	NA	20.0%	18.8%	NA	NA	NA	18.5%	17.7%	NA	NA	NA
PY 1	17.4%	16.2%	0.1 (0.2)	(-0.3, 0.5)	0.582	18.4%	17.2%	0.0 (0.3)	(-0.5, 0.5)	0.913	16.4%	15.3%	0.3 (0.4)	(-0.3, 0.9)	0.428
PY 2	15.5%	14.8%	-0.3 (0.3)	(-0.8, 0.2)	0.260	16.3%	16.3%	-1.2*** (0.4)	(-1.9, -0.6)	0.002	14.7%	13.3%	0.5 (0.4)	(-0.2, 1.3)	0.220
PY 3	13.3%	13.2%	-0.9*** (0.3)	(-1.4, -0.4)	0.005	14.6%	14.5%	-1.1** (0.5)	(-1.8, -0.3)	0.016	12.2%	12.1%	-0.8 (0.5)	(-1.6, 0.0)	0.115
PY 4	12.5%	12.3%	-0.8** (0.4)	(-1.4, -0.2)	0.020	13.9%	13.8%	-1.1** (0.5)	(-1.9, -0.3)	0.029	11.2%	11.0%	-0.6 (0.5)	(-1.5, 0.2)	0.233
PY 1 through PY 4	14.8%	14.2%	-0.4* (0.3)	(-0.8, 0.0)	0.083	15.9%	15.4%	-0.7** (0.3)	(-1.3, -0.2)	0.024	13.7%	13.0%	-0.1 (0.4)	(-0.7, 0.5)	0.754
Unweighted sample sizes[c]															
Number of beneficiaries	83,294	269,795				40,615	147,567				42,766	122,779			
Number of beneficiary-years	188,400	611,115				91,641	333,214				96,759	277,901			
Track 2 results															
Baseline	19.6%	19.2%	NA	NA	NA	19.6%	18.9%	NA	NA	NA	19.6%	19.4%	NA	NA	NA
PY 1	17.7%	17.3%	0.0 (0.3)	(-0.4, 0.5)	0.846	18.3%	17.4%	0.2 (0.4)	(-0.4, 0.8)	0.585	17.4%	17.3%	-0.1 (0.3)	(-0.6, 0.5)	0.854
PY 2	15.6%	15.6%	-0.3 (0.3)	(-0.8, 0.2)	0.349	16.6%	16.2%	-0.4 (0.5)	(-1.3, 0.5)	0.516	15.0%	15.0%	-0.1 (0.4)	(-0.8, 0.6)	0.758
PY 3	13.5%	14.1%	-1.1*** (0.4)	(-1.6, -0.5)	0.003	14.6%	14.6%	-0.7 (0.6)	(-1.7, 0.3)	0.250	12.7%	13.7%	-1.2** (0.5)	(-1.9, -0.4)	0.013
PY 4	12.6%	12.8%	-0.7* (0.4)	(-1.3, -0.0)	0.083	13.6%	13.8%	-0.9 (0.6)	(-2.0, 0.1)	0.132	11.9%	12.2%	-0.4 (0.5)	(-1.2, 0.4)	0.395
PY 1 through PY 4	14.9%	15.0%	-0.5* (0.3)	(-0.9, 0.0)	0.093	15.9%	15.6%	-0.4 (0.4)	(-1.1, 0.3)	0.364	14.3%	14.6%	-0.4 (0.3)	(-0.9, 0.2)	0.294
Unweighted sample sizes[c]															
Number of beneficiaries	99,958	219,993				40,467	104,319				59,646	116,065			
Number of beneficiary-years	225,859	497,835				90,299	235,626				135,560	262,209			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] We report the actual, unadjusted averages in the baseline period, which are similar for the CPC+ and comparison groups due to matching. In the intervention periods, the comparison group mean is computed by subtracting the regression-adjusted difference between the CPC+ and comparison means in each time period from the CPC+ mean in that same time period.

Table 5.H.10 (*continued*)

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries assigned to CPC+ practices in the first four years of CPC+ and the average outcome in the baseline year, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and changes in state-level PDMP characteristics and opioid funding.

[c] After accounting for weights that adjust for matching, the effective sample sizes fall but are still substantial. For the comparison group, the effective sample size is 38 to 48 percent of the actual sample size. The effective sample size for the CPC+ group is 100 percent because it is not affected by the matching weights.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

NA = not applicable because the difference-in-differences impact estimate cannot be calculated at baseline.
C = comparison; FFS = fee-for-service; PDMP = prescription drug monitoring program; PY = Program Year; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.H.11. Difference-in-differences (falsification test) results for the effect of CPC+ on potential opioid overuse and long-term opioid use in 2016, by track and by SSP versus non-SSP status

	Overall					SSP					Non-SSP				
	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value	CPC+ mean[a]	C mean[a]	Impact estimate[b] (SE)	90 percent confidence interval	*p*-Value
Potential opioid overuse															
Track 1 results															
2015	20.4%	19.4%	NA	NA	NA	21.0%	19.7%	NA	NA	NA	19.7%	19.1%	NA	NA	NA
2016	23.2%	22.1%	0.1 (0.2)	(-0.3, 0.5)	0.639	24.2%	22.9%	-0.1 (0.3)	(-0.6, 0.4)	0.795	22.2%	21.3%	0.2 (0.3)	(-0.3, 0.8)	0.466
Unweighted sample sizes[c]															
Number of beneficiaries	38,222	123,192				18,946	66,135				19,276	57,057			
Number of beneficiary-years	66,045	213,237				32,716	114,278				33,329	98,959			
Track 2 results															
2015	20.9%	20.3%	NA	NA	NA	21.0%	19.7%	NA	NA	NA	20.9%	20.7%	NA	NA	NA
2016	23.7%	23.0%	0.0 (0.2)	(-0.3, 0.4)	0.906	-0.3%	0.4%	-0.1 (0.3)	(-0.7, 0.4)	0.738	23.7%	23.3%	0.1 (0.3)	(-0.4, 0.6)	0.673
Unweighted sample sizes[c]															
Number of beneficiaries	46,145	100,520				18,481	47,088				27,664	53,432			
Number of beneficiary-years	79,861	174,030				31,891	81,456				47,970	92,574			
Long-term opioid use															
Track 1 results															
2015	8.4%	8.1%	NA	NA	NA	8.0%	7.5%	NA	NA	NA	8.8%	8.9%	NA	NA	NA
2016	8.2%	8.0%	-0.1 (0.0)	(-0.1, 0.0)	0.133	7.8%	7.3%	0.0 (0.1)	(-0.1, 0.1)	0.913	8.6%	8.8%	-0.1** (0.1)	(-0.2, 0.0)	0.042
Unweighted sample sizes[c]															
Number of beneficiaries	467,524	1,535,451				243,629	886,623				223,895	648,828			
Number of beneficiary-years	889,605	2,923,744				463,430	1,688,266				426,175	1,235,478			
Track 2 results															
2015	8.4%	8.0%	NA	NA	NA	7.6%	7.4%	NA	NA	NA	9.1%	8.4%	NA	NA	NA
2016	8.2%	7.8%	-0.1 (0.0)	(-0.1, 0.0)	0.110	7.4%	7.2%	0.0 (0.1)	(-0.1, 0.1)	0.748	8.9%	8.3%	0.0* (0.1)	(-0.2, 0.0)	0.070
Unweighted sample sizes[c]															
Number of beneficiaries	560,955	1,304,030				248,968	650,627				311,987	653,403			
Number of beneficiary-years	1,067,100	2,484,407				472,934	1,240,120				594,166	1,244,287			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2016.

Table 5.H.11 (*continued)*

Notes: Although this table indicates which estimates are statistically significant, when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources about model implementation.

[a] We report the actual, unadjusted averages in 2015. In 2016, the comparison group mean is computed by subtracting the regression adjusted difference between the CPC+ and comparison means from the CPC+ mean.

[b] Each impact estimate is regression-adjusted using a difference-in-differences analysis that reflects the difference between the average outcome for Medicare FFS beneficiaries assigned to CPC+ practices in 2016 and the average outcome in 2015, relative to the same difference over time for Medicare FFS beneficiaries assigned to comparison practices, while controlling for beneficiary characteristics, practice fixed effects, and changes in opioid funding. We did not include changes in state-level PDMP characteristics because we did not collect those data for 2015.

[c] After accounting for weights that adjust for matching, the effective sample sizes fall but are still substantial. For the comparison group, the effective sample size is 39 to 48 percent of the actual sample size. The effective sample size for the CPC+ group is 100 percent of the actual sample size because it is not affected by the matching weights.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

NA = not applicable because the difference-in-differences impact estimate cannot be calculated at baseline.

C = comparison; FFS = fee-for-service; PDMP = prescription drug monitoring program; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.H.12. Difference-in-differences estimates of the effect of CPC+ on long-term use and potential opioid overuse over the first four program years, by beneficiary subgroup within each track

Subgroup definition	Number (percentage) of CPC+ beneficiaries in subgroup at baseline	Impact estimate (standard error)	*p*-Value for difference in impact estimates between subgroups
Long-term use of opioids			
Track 1			
Main analysis (all Track 1 practices)	--	**0.0 (0.1)**	--
Beneficiaries with disabilities			
Yes	110,896 (22.4%)	0.1 (0.2)	
No	384,464 (77.6%)	-0.1 (0.1)	0.41
Beneficiaries dually eligible for Medicare and Medicaid			
Yes	88,685 (17.9%)	-0.1 (0.2)	
No	406,675 (82.1%)	-0.1 (0.0)	0.82
Track 2			
Main analysis (all Track 2 practices)	--	**-0.1* (0.1)**	--
Beneficiaries with disabilities			
Yes	133,061 (22.2%)	0.0 (0.2)	
No	467,554 (77.8%)	-0.2 (0.0)	0.56
Beneficiaries dually eligible for Medicare and Medicaid			
Yes	106,333 (17.7%)	-0.1 (0.2)	
No	494,282 (82.3%)	-0.2 (0.0)	0.82
Potential opioid overuse			
Track 1			
Main analysis (all Track 1 practices)	--	**-0.4* (0.3)**	--
Beneficiaries with disabilities			
Yes	23,343 (58.0%)	-0.3 (0.4)	
No	16,876 (42.0%)	-0.7 (0.3)	0.32
Beneficiaries dually eligible for Medicare and Medicaid			
Yes	16,375 (40.7%)	-0.5 (0.4)	
No	23,844 (59.3%)	-0.5 (0.3)	0.94
Track 2			
Main analysis (all Track 2 practices)	--	**-0.5* (0.3)**	--
Beneficiaries with disabilities			
Yes	27,823 (57.1%)	-0.6 (0.4)	
No	20,924 (42.9%)	-0.4 (0.3)	0.78
Beneficiaries dually eligible for Medicare and Medicaid			
Yes	19,308 (39.6%)	-1.0 (0.4)	
No	29,439 (60.4%)	-0.2 (0.3)	0.13

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2020.

Note: The *p*-values in the last column represent results from testing for statistically significant differences in impact estimates between the subgroups defined at baseline (using a t-test for subgroups with two categories). Since this test did not indicate a statistically significant or meaningful difference between any subgroups defined by the same characteristic, we did not further test whether estimates within each subgroup were statistically significant.

*/**/***Estimate significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

CPC+ = Comprehensive Primary Care Plus.

5.H.4. Discussion

Overall opioid prescribing and high-dose prescribing have been decreasing in the United States in the last several years (CDC 2019, 2020). This is consistent with our findings, which show declines in any use of opioids, long-term use, and potential overuse in our sample between 2016 and 2020. We also found that the decrease in potential opioid overuse was larger than the decrease in the long-term use of opioids.

We found a statistically significantly greater reduction in long-term use of opioids among Medicare FFS beneficiaries assigned to CPC+ practices than among the comparison group in the third and fourth years for Track 2 and a reduction of similar size (though not statistically significant) in the fourth year for Track 1. There was also a statistically significantly greater reduction in potential opioid overuse between baseline and the third and fourth years of CPC+ in Track 1 and similar decreases for Track 2. Even though Track 2 provided a more intensive set of services, the magnitude of the estimated impacts on long-term use and potential overuse of opioids was similar in both tracks and confidence intervals largely overlapped.

Greater reductions in potential opioid overuse and long-term use among CPC+ practices and the timing of those reductions could be consistent with implementation results (Appendix 3.B) that indicate greater use of CMM and greater behavioral health integration between the first and the fourth year of CPC+ by CPC+ practices in both tracks, including:

- The proportion of CPC+ practices with access to a behaviorist more than doubled over the first four program years. For Track 1, it increased from 18 percent of practices in the first year of CPC+ to 45 percent in the fourth year; for Track 2, it increased from 31 to 68 percent.
- Similarly, the proportion of practices with access to an on-site part-time or full-time pharmacist also more than doubled. For Track 1, it increased from 14 percent in the first year of CPC+ to 24 percent in the fourth year; for Track 2, it increased from 21 to 52 percent.

Further, in the third year of CPC+, a greater proportion of physicians in CPC+ practices than comparison practices reported having on-site behavioral and mental health counseling: for Track 1, 56 percent of CPC+ versus 44 percent of comparison practices and for Track 2, 72 percent of CPC+ versus 47 percent of comparison practices (Orzol et al. 2021).

However, the relationship between the favorable impact findings and improvements in care processes in CPC+ warrants further exploration because the degree of CMM implementation and behavioral health integration varied across practices, and there were other simultaneous changes that could influence potential opioid overuse. Some of the changes included improvements in care delivery in terms of access, continuity, comprehensiveness and coordination of care, as well as the use of data for planned care and population health. Within the area of comprehensiveness, for instance, practices were encouraged to screen patients for health-related social needs and to help address them through connections with community-based social service entities. A key area for further research is to explore the mechanisms by which CPC+ reduced potential opioid overuse, for example, by correlating the changes in opioid use with the changes in care processes.

Recent small-scale research studies of interventions that focus on opioid prescribing and opioid use may provide a guide as to the mechanisms that we should explore. As an example, enhanced medication management was one component of an intervention implemented in 20 primary care rural clinics in eastern Washington that reduced high-dose opioid prescribing and use (Parchman et al. 2019). Similarly, a multi-modal pain care intervention at a Veterans Affairs health system that resulted in successful tapering of opioid dosages included behavioral health support and a pharmacist within primary care practices (Seal et al. 2020).

Another area for further research involves the dual epidemics of opioid use and COVID-19 (Volkow 2020; Alexander et al. 2020). Because increases in overdoses greatly accelerated during the COVID-19 pandemic in the general population (AMA 2021), one possible topic is to analyze changes in opioid overdoses over time and CPC+'s impact on opioid overdoses among Medicare beneficiaries. Using the diagnoses for non-fatal and fatal overdoses in Part A and B data would enable us to capture overdoses from both prescription and illicitly manufactured opioids. Capturing overdoses from illicit opioids is important given that increases in overdoses during the COVID-19 pandemic are driven by illicitly manufactured synthetic opioids such as fentanyl and, more recently, combinations of drugs (Ciccarone 2021).

There are several limitations of our analysis. First, practices were not randomly assigned to CPC+ and the comparison group. Despite having similar observable characteristics at baseline, CPC+ and comparison practices could differ on unobserved characteristics that may influence opioid use, such as unmeasured changes in state opioid policies. The amounts of state opioid-related grant funding were not available for 2019 and 2020, the two years in which we find favorable impacts on long-term use and potential opioid overuse. However, we controlled for changes in the sophistication of PDMPs through 2020. It is also reassuring that sensitivity analyses showed that our results did not change whether or not we controlled for state opioid funding and PDMP characteristics. Second, with only two years of pre-CPC+ data, we were unable to fully test for parallel trends in potential opioid overuse between CPC+ and comparison practices. However, as the falsification test results show, it was unlikely that CPC+ and comparison practices experienced different trends in the pre-CPC+ period. Third, even though the *potential* opioid overuse outcome excludes most of the beneficiaries for whom such use is appropriate (those with cancer or sickle cell disease, and those who use hospice), it does not consider *all* appropriate use, such as use in non-hospice palliative care (CMS 2018). However, this is unlikely to be a major concern because potential opioid overuse is measured the same way for CPC+ and comparison groups, which were very similar at baseline and had similar changes in beneficiary and practice characteristics over time. Finally, the generalizability of our findings to other large-scale initiatives may be limited because CPC+ was tested in the regions, payers, and practices that volunteered to participate and were selected by CMS. That said, this is the largest primary care transformation initiative in Medicare and therefore has potential implications for other practices.

5.I. CPC Classic longer-term effects analysis

This Appendix examines the longer-term effects of primary care transformation—the four-year Comprehensive Primary Care Initiative (CPC Classic) and the first three years of its successor Comprehensive Primary Care Plus (CPC+)—on Medicare Part A and B expenditures (excluding care management fees) and health care service use. In this Appendix, we first introduce the motivation for this analysis and the CPC Classic and CPC+ interventions (Section 1). We next explain the analytic methods (Section 2). Finally, we describe the results (Section 3) and discuss their implications (Sections 4 and 5).

5.I.1. Introduction

A. Background

Payers around the country are testing the patient-centered medical home (PCMH) and similar models and are increasingly paying for health care through alternative payment models that reward quality and value. Researchers and practitioners have warned that it takes time to transform care and shift patient outcomes (Nutting et al. 2009; Crabtree et al. 2011; McNellis et al. 2013; Peikes et al. 2020a), but there have been no long-term models to assess whether the generally minimal changes that have been documented in outcomes such as emergency department (ED) visits and hospitalizations improve with longer interventions or follow-up periods. Against this backdrop, it is important to understand how longer tests of these models are associated with health care spending and utilization.

The Centers for Medicare & Medicaid Services (CMS) launched the four-year multipayer CPC Classic Initiative in October 2012. The goals of CPC Classic were to improve primary care delivery, health care quality, and patient experience, and to lower costs. CPC Classic also aimed to enhance clinicians' and staff members' experience. Across the country, 502 practices participated in CPC Classic, and 85 percent of them immediately joined its five-year successor, CPC+, in 2017.

This analysis takes advantage of this unusually long combined model to examine the longer-term effects of primary care transformation on expenditures and service use for Medicare fee-for-service (FFS) beneficiaries. We examine effects over seven years—the four years of CPC Classic and three years after, which for most practices included three years of participation in the successor model, CPC+. We hypothesized that favorable effects with primary care transformation would emerge or remain the same over time.

B. Intervention

CMS launched the four-year CPC Classic initiative in October 2012 (Peikes et al. 2018b). CPC Classic tested whether it was possible to reduce spending and improve quality by requiring primary care practices to improve care delivery in five areas: (1) access to and continuity of care, (2) planned care for preventive and chronic needs, (3) risk-stratified care management, (4) engagement of patients and their caregivers, and (5) coordination of care with patients' other care providers. The model provided substantially enhanced payments, including a $20 per

beneficiary per month (PBPM) care management fee (CMF) from CMS in the first two years, and a $15 PBPM CMF in the last two years, as well as data feedback and learning support. A total of 502 primary care practices participated in CPC Classic. Over the four-year initiative, CPC Classic reduced hospitalizations by 1.6 percent and reduced the growth in total and outpatient ED visits by 2 percent among CPC Classic practices relative to comparison practices; however, CPC Classic did not appreciably lower Medicare Part A and B expenditures. A favorable 1.7 percent (p = 0.06) relative reduction in hospitalizations emerged in Year 1, but the estimates were not statistically significant in Year 2 (1.6 percent, p = 0.14), Year 3 (0.8 percent, p = 0.42), and Year 4 (1.7 percent, p = 0.13). The favorable reductions in growth rate of ED visits were statistically significant in the third (2.4 percent, p = 0.02) and fourth (2.1 percent, p = 0.05) model years.

Building on the lessons of CPC Classic and other advanced primary care models, in January 2017, CMS launched the five-year CPC+ model, which is the largest and most ambitious primary care payment and delivery reform ever tested in the United States (Anglin et al. 2020). Table 5.I.1 shows the main features of the two models were similar, with the notable differences being that CPC+:

- Was larger in size,
- Increased the emphasis on aspects of comprehensiveness, including behavioral health integration and assessing and addressing patients' social support needs,
- Allowed simultaneous participation in the Medicare Shared Savings Program (SSP),
- Included the following features for the more advanced care transformation track:
  - Health information technology support,
  - Substantially higher enhanced payments and progressively larger alternative-to-FFS payments, and
  - Requirements for some more advanced care delivery approaches.

CMS offered all CPC Classic practices participation in CPC+ if they met basic eligibility criteria. After CPC Classic ended, many of the CPC Classic practices (85 percent) joined CPC+ in 2017, predominantly in Track 2 (and most continued participating in 2018). Specifically, 71 CPC Classic practices joined Track 1 of CPC+ and constituted 5 percent of all Track 1 practices that began CPC+ in 2017; 352 CPC Classic practices joined Track 2 of CPC+ and constituted 23 percent of all Track 2 2017 Starters in CPC+.

Table 5.I.1. Comparison of the CPC Classic and CPC+ models

	CPC Classic	CPC+
Model		
Model duration	Four years (October 2012–December 2016)	Five years (January 2017–December 2021) This analysis covers the first three years.
Care delivery requirements	(1) Access to and continuity of care, (2) planned care for preventive and chronic needs, (3) risk-stratified care management, (4) engagement of patients and their caregivers, and (5) coordination of care with patients' other care providers	(1) Access and continuity, (2) care management, (3) comprehensiveness and coordination, (4) patient and caregiver engagement, and (5) planned care and population health. CPC+ increased the emphasis on aspects of comprehensiveness, including behavioral health integration and assessing and addressing patients' social support needs. CPC+ includes two tracks with different levels of care delivery requirements and payment approaches to meet the diverse needs of participating practices. Track 2 practices are required to provide more enhanced care delivery approaches to better support patients with complex needs than Track 1 practices, and they receive higher payments.
Reach		
Partners	CMS 39 other private and public payers	CMS 79 other private and public payers 68 health IT vendors
Number of regions	7	18
Number of intervention practices	502	3,070 (1,504 in Track 1 and 1,566 in Track 2)
Number of beneficiaries served	Over 2.5 million	Over 17 million
Supports		
Average of risk-adjusted care management fees PBPM[a]	From CMS: $20 in first two years, $15 in last two years; lower from other payers	From CMS: $15 for Track 1, $28 PBPM for Track 2; lower from other payers
Median enhanced funding per practice (also calculated per primary care practitioner) in the latest model year (4 for CPC, and 2 for CPC+)[b, c]	$179,519 (or $50,189 per practitioner), or 10 percent of practice revenue	Track 1: $122,065 (or $42,964 per practitioner), or 10 percent of practice revenue Track 2: $263,606 (or $66,424 per practitioner), or 15 percent of practice revenue

Table 5.I.1 ***(continued)***

	CPC Classic	CPC+
Payments other than CMFs[b]	Share in any savings after covering CMFs starting in Year 2, offered by Medicare FFS and two-thirds of other payers.	Payments for performance on cost, utilization, and/or quality measures, offered by Medicare FFS and 94 percent of other payers. Unlike CPC Classic, CPC+ practices also have the option to participate in Medicare SSP. If they do, they can earn shared savings from that program but are not eligible for performance-based payments from CPC+ because of CMS's rules that prohibit "double dipping". Alternative to FFS payments starting in CPC+ Year 1 by CMS and 22 percent of payer partners in Year 2 for Track 2. A portion of FFS payments was converted to lump sum payments regardless of visits.
Non-financial supports	Data feedback, learning support	Data feedback, learning support, and health IT vendor support

[a] CMS risk adjusts CMFs based on beneficiaries' hierarchical condition category score, which is a claims-based measure of risk for subsequent expenditures.

[b] Numbers reported in the CPC+ column apply to all practices that joined CPC+ in 2017 and are not limited to the CPC Classic alumni.

[c] The enhanced funding included CMFs and performance-based payments. In Year 2 of CPC+, CMFs represented 90 percent of total enhanced funding.

CMFs = care management fees; CMS = Centers for Medicare & Medicaid Services; CPC Classic = Comprehensive Primary Care initiative; CPC+ = Comprehensive Primary Care Plus; FFS = fee-for-service; IT = information technology; PBPM = per beneficiary per month, SSP = Medicare Shared Savings Program.

5.I.2. Methods

A. Evaluation design

To measure the effects of primary care transformation with service use and spending, we compared changes in outcomes from the year before CPC Classic began (baseline period) to the seven-year period after it began (intervention period), between Medicare FFS beneficiaries served by intervention practices (defined as those that began CPC Classic and were still participating during the second quarter) and those served by matched comparison practices. We used propensity score matching to ensure pre-intervention similarity between intervention and comparison practices across beneficiary, practice, and market characteristics. Matching variables included beneficiaries' characteristics (such as age, sex, HCC scores, and prior expenditures and service use); practice-level characteristics (such as meaningful use of electronic health records, number of clinicians, and percentage of clinicians with a primary care specialty); and characteristics of the practice's market (such as mean county income). We selected as many as five comparison practices for each CPC Classic practice.

Starting in the first quarter of CPC Classic, Medicare FFS beneficiaries were attributed quarterly to CPC and comparison practices that delivered the largest share of their primary care visits during a two-year lookback period. We then used an intent-to-treat (ITT) design to assign

beneficiaries to practices in the intervention period; that is, once we had attributed beneficiaries to a practice (intervention or comparison) at any time during the intervention period, they remained in the analysis sample as long as they met the eligibility criteria (alive and enrolled in Medicare Part A and Part B with Medicare as the primary payer and not in a Medicare Advantage Plan).

For the baseline period, we defined the study sample as beneficiaries who were attributed to the intervention or comparison practices during the intervention period and were alive at the start of the period. As a result, the baseline sample did not include people who had died during the baseline year. This meant that Medicare expenditures and service use during the baseline period were lower (for both the intervention and comparison groups) than in later periods because the baseline period did not include beneficiaries who needed expensive end-of-life care.

For details on matching methods, attribution, and ITT design, please refer to the supplemental appendix in Dale et al. (2016).

B. Measures of spending and utilization

We constructed four main outcomes from Medicare claims and enrollment data: (1) Medicare Part A and Part B expenditures excluding enhanced payments made for CPC Classic, CPC+, or the Shared Savings Program (SSP); (2) hospitalizations; (3) outpatient ED visits; and (4) total ED visits. We also examined impacts on expenditures by service category: (1) inpatient, (2) outpatient, (3) physician, (4) home health, (5) hospice, (6) skilled nursing facility, and (7) durable medical equipment.

C. Statistical analysis

We implemented a difference-in-differences model that compares the mean change in outcomes from the year before the start of CPC Classic to the seven years after between two groups: (1) beneficiaries served by the CPC Classic practices and (2) beneficiaries served by comparison practices. We used (1) linear regressions for Medicare Part A and Part B expenditures and (2) zero-inflated negative binomial regressions for hospitalizations, outpatient ED visits, and total ED visits to account for a large percentage of zeroes. The regressions controlled for beneficiary, practice, and market characteristics observed at baseline to net out observable pre-existing baseline differences between CPC Classic and comparison beneficiaries that remained after propensity score matching. Estimated standard errors accounted for beneficiary outcomes clustered at the practice level and for weighting. The overall weights were equal to the product of two separate weights that accounted for (1) the share of the year for which the beneficiary's data were observed and (2) a matching weight (derived from the propensity score matching procedure) ensuring that CPC Classic and comparison practices were balanced. We performed all statistical analyses with Stata software (Version 15.1). We provide *p*-values for all estimates and consider *p*-value < 0.10 to be statistically significant.

5.I.3. Results

A. Practices included in the study sample

The analysis included 497 practices participating at the end of CPC Classic's first quarter and 908 similar comparison practices. None of the comparison practices joined CPC Classic (by design); 21 percent joined CPC+ in 2017. Table 5.I.2 shows the baseline similarity of the intervention and comparison groups' practice characteristics and Figure 5.I.1 shows the similarity in the trajectories of their Medicare expenditures, hospitalizations, outpatient ED visits, and total ED visits in the two years before CPC Classic began (Dale et al. 2016).

Table 5.I.2. Baseline practice characteristics of CPC Classic and comparison practices[a]

Characteristic	Intervention practices	Comparison practices	Difference between intervention and comparison practices	*p*-Value
Percentage of practices with one or more clinicians who was a Medicare meaningful EHR user as of June 2012[b]	79	79	0	>0.99
Percentage of practices with state or NCQA medical-home recognition by autumn 2012[c]	39	37	2.9	0.20
Mean number of clinicians[d]	4.2	4.6	-0.4	0.64
Percentage of practices' clinicians with primary care specialty[d]	94	94	0	0.92
Percentage of practices owned by larger organization[d]	55	54	1	0.85
Percentage of practices located in medically underserved area[e]	11	14	-3	0.17
Percentage of practice's county that is urban[f]	78	75	3	0.08
Mean number of attributed Medicare beneficiaries[g]	635	698	-63	0.14

[a] Because the CPC Classic intervention was provided at the practice level, and to aid computation, we matched using practice-level data rather than beneficiary-level data. The means (rounded to whole numbers) in this table represent practice-level means, weighted to account for matching.

[b] A meaningful EHR user is a clinician who qualified for CMS incentive programs by having used certified EHR technology to improve the quality of health care and to meet other objectives specified by CMS.

[c] Numbers are based on September 2012 data from NCQA.

[d] Data are from a 2012 office-based physician file from SK&A, a health care marketing vendor.

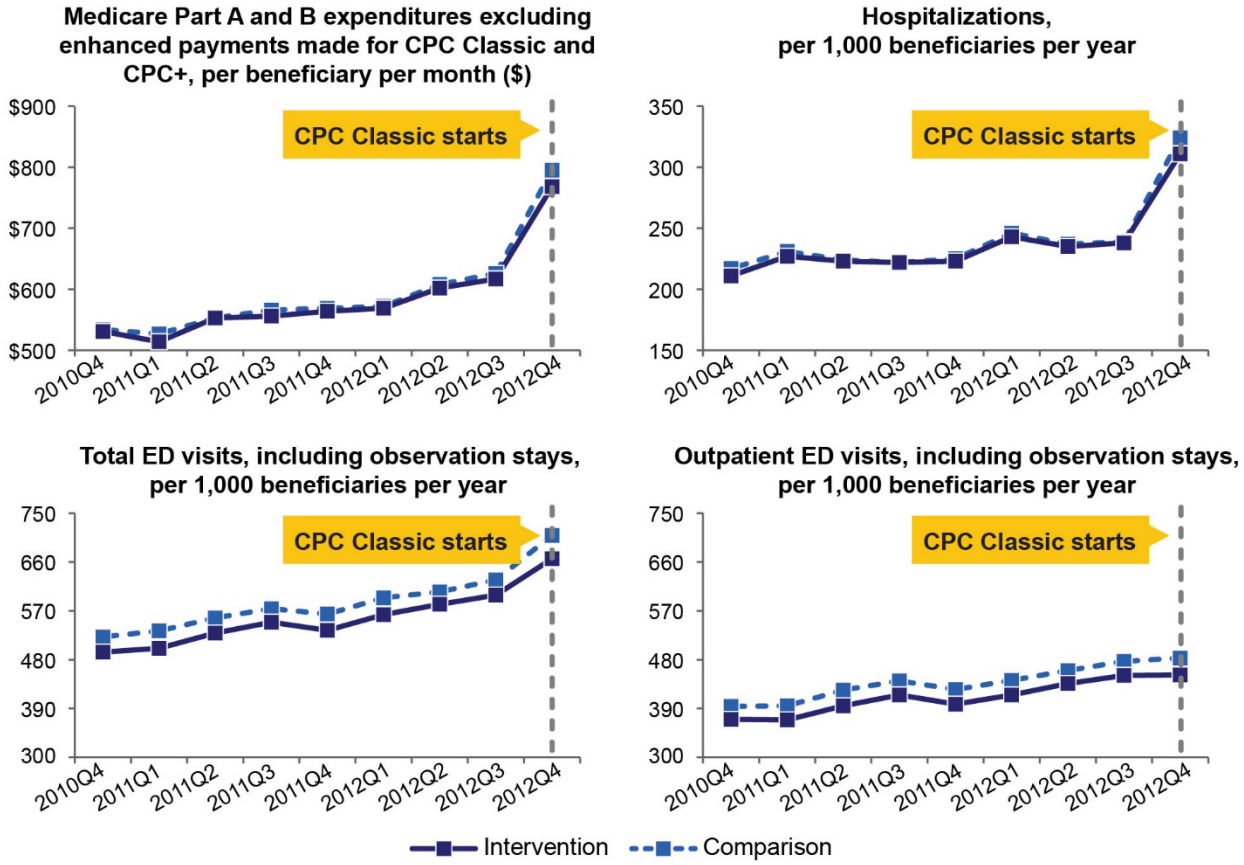
[e] Numbers are based on 2009 data from the HRSA.

[f] Data are from the 2009 Area Health Resource Files provided by the HRSA.

[g] Numbers are based on 2010-2012 Medicare claims and enrollment data from the CMS Virtual Research Data Center.

CMS = Centers for Medicare & Medicaid Services; CPC = comprehensive primary care; EHR = electronic health record; HRSA = Health Resources and Services Administration; NCQA = National Committee for Quality Assurance.

Figure 5.I.1. Quarterly trends in average Medicare expenditures, hospitalizations, outpatient ED visits, and total ED visits of CPC Classic and comparison beneficiaries in the two years before CPC Classic began



Source: Medicare claims data for October 2010 through December 2012.

Notes: Expenditures and utilization are lower in the baseline quarters (relative to the first intervention quarter [Q4 2012]) because the baseline sample only included beneficiaries who were attributed (and hence alive) during the intervention period; this meant that Medicare expenditures and service use during the baseline period were lower (for both the intervention and comparison groups) than in later periods because the baseline period did not include beneficiaries who needed expensive end-of-life care.

B. Beneficiaries included in the study sample

We included all beneficiaries attributed to CPC Classic and their comparison practices, from the first intervention year until the fourth intervention year (October 2012 to December 2016). After CPC Classic ended, we did not re-run attribution. For the next three years (January 2017 to December 2019), we followed the beneficiaries already assigned in the fourth-year analysis sample into their fifth, sixth, and seventh years, with the same intervention or comparison status as in CPC Classic. Table 5.I.3 shows that the baseline beneficiary characteristics and outcomes for the intervention and comparison groups were similar.

Table 5.I.3. Baseline outcomes and characteristics of CPC Classic and comparison beneficiaries in the research sample[a]

Panel A. Baseline characteristics of beneficiaries included in the research sample[b]

Measure	Intervention mean[c] (N = 565,674)	Comparison mean[c] (N = 1,165,284)	Intervention-comparison difference	Standardized difference
Age				
Younger than 50	6.1	6.7	-0.6	0.03
50–64	16.7	16.8	-0.2	0.00
65–74	41.2	41.0	0.2	-0.01
75–84	24.8	24.8	0.0	0.00
85 or older	11.2	10.7	0.6	-0.02
Race				
White	90.6	91.0	-0.4	0.02
Black	4.4	4.5	-0.2	0.01
Native American	1.8	1.1	0.7	-0.06
Other	3.3	3.4	-0.1	0.01
Male	41.7	42.1	-0.4	0.01
Original reason for Medicare eligibility				
Age	78.5	77.3	1.2	-0.03
Disabled	21.3	22.6	-1.2	0.03
ESRD	0.1	0.1	0.0	0.00
Dually eligible for Medicare and Medicaid	11.4	13.1	-1.7	0.06
HCC score (continuous measure)[d]	1.0	1.0	0.0	0.01
HCC score originally missing and imputed	9.7	9.6	0.2	-0.01

Panel B. Baseline outcomes of beneficiaries in the research sample who had baseline data

Measure	Intervention mean[c] (N = 442,709)	Comparison mean[c] (N = 954,199)	Intervention-comparison difference	Standardized difference
Main outcomes				
Medicare expenditures without fees (PBPM)	$574.1	$578.3	-$4.1	0.00
Hospitalizations (per 1,000 beneficiaries per year)	227.6	228.8	-1.2	0.00
Total ED visits (per 1,000 beneficiaries per year)	556.3	580.4	-24.1	0.02
Outpatient ED visits (per 1,000 beneficiaries per year)	417.4	440.5	-23.2	0.02
Other outcomes: Expenditures by service category (PBPM)				
Inpatient	$196.9	$192.4	$4.5	-0.01
Outpatient	$97.2	$103.1	-$5.8	0.02
Physician	$199.6	$195.0	$4.6	-0.01
Skilled nursing	$29.6	$31.8	-$2.3	0.01
Home health	$26.3	$30.3	-$4.0	0.04
Hospice	$2.0	$2.4	-$0.5	0.01
Durable medical equipment	$22.5	$23.2	-$0.7	0.01

Table 5.I.3 *(continued)*

[a] Medicare claims and enrollment data for October 2011 through December 2019. The baseline outcomes are not available for beneficiaries who were added to the sample in later years but were not eligible at baseline. However, we were able to obtain the baseline characteristics for these beneficiaries using the following approach: (1) for race, gender, and original reason for Medicare eligibility at baseline, we used data from the time the beneficiary first became eligible; (2) we calculated age using the date of birth reported; (3) for dual eligibility, we conservatively assumed that these beneficiaries were not dual eligible at baseline; (4) for HCC scores, we imputed the baseline (2011) scores for these beneficiaries, specifically by using the average (non-missing) HCC score of 66-year-old beneficiaries for beneficiaries with missing HCC scores who were 65 years or older and the average (non-missing) HCC scores for beneficiaries below age 65 for beneficiaries with missing HCC scores who were under age 65.

[b] Data are percentages in Panel A, unless noted.

[c] Means (rounded to one decimal place) were weighted to account for (1) the share of the year for which the beneficiary's data were observed and (2) the matching (for beneficiaries in comparison practices only).

[d] HCC scores are a measure of risk for subsequent expenditures. CMS calculates them such that the average for the Medicare FFS population nationally is 1.0. A patient with a risk score of 1.30 is predicted to have expenditures that would be approximately 30 percent above the average, whereas a patient with a risk score of 0.70 is expected to have expenditures that would be approximately 30 percent below the average.

CMS = Centers for Medicare & Medicaid Services; ED = emergency department; ESRD = end-stage renal disease; FFS = fee-for-service; HCC = hierarchical condition category; PBPM = per beneficiary per month.

C. Difference-in-differences estimates for main outcomes

During the seven years since CPC Classic began, the cumulative estimates indicate that intervention and comparison practices had similar Medicare FFS expenditures over time. However, there was an overall slower growth in hospitalizations, total ED visits, and outpatient ED visits among intervention practices, relative to comparison practices (Table 5.I.4). When assessing the annual estimates (shown in Figure 5.I.2), we found the following:

1. Relative to comparison practices, beneficiaries in intervention practices experienced the following effects:
   - Slower growth in hospitalizations (2.4 percent, $p = 0.01$) over the seven years after CPC Classic began. The estimates were smaller in the first four years (1.7 percent or less) and were statistically significant only in Year 1 (1.6 percent, $p = 0.07$). Annualized hospitalizations per 1,000 beneficiaries for CPC Classic beneficiaries increased by 9 fewer hospitalizations (2.9 percent, $p = 0.01$) in Year 5 and 11 fewer hospitalizations in Years 6 and 7, relative to comparison beneficiaries, which translated to relative reductions of 3.4 percent ($p < 0.01$) in Year 6 and of 3.3 percent ($p = 0.01$) in Year 7.
   - Slower growth in total ED visits (2.2 percent, $p = 0.01$) over the seven years after CPC Classic began. The estimates became sizable and statistically significant starting in Year 3. Relative to comparison beneficiaries, there were slower growths ranging from 2 to 2.5 percent in total ED visits for CPC Classic beneficiaries in Years 3 through 6. The Year 7 estimate of relative reduction was higher (3.8 percent, $p < 0.01$).
   - Slower growth in outpatient ED visits (2.0 percent, $p = 0.05$) over the seven years after CPC Classic began. Like the total ED visits, the estimates became sizable and statistically significant starting from Year 3. Relative to comparison beneficiaries, there was a slower growth of approximately 2 percent in outpatient ED visits for CPC Classic beneficiaries in Years 3 through 5. The estimates for Year 6 and 7 were more variable: relative reduction of 3.7 percent ($p = 0.01$) in Year 7 and 1.5 percent in Year 6 which was not statistically significant ($p = 0.23$).

2. There was no discernible effect on CPC Classic beneficiaries' Medicare Part A and B expenditures excluding additional payments from CPC Classic, CPC+, and SSP in the seven years after CPC Classic began, relative to comparison beneficiaries. A statistically significant reduction in growth of expenditures (2.2 percent, $p = 0.01$) was observed in Year 1; however, it was too soon after the start of CPC Classic to be plausible as a causal impact. This reduction was not seen in any subsequent years.

Table 5.I.4. Regression-adjusted means and difference-in-differences estimates for service use and expenditures among attributed Medicare fee-for-service beneficiaries for CPC Classic and comparison practices, annual and seven-year cumulative estimates

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Service use (per 1,000 beneficiaries per year)						
Hospitalizations						
Baseline	228	229	n.a.	n.a.	n.a.	n.a.
Y1	309	315	-5.1* (2.8)	-1.6%	(-9.7, -0.5)	0.07
Y2	295	301	-4.7 (3.2)	-1.6%	(-10.0, 0.5)	0.14
Y3	302	306	-2.6 (3.2)	-0.8%	(-7.8, 2.7)	0.42
Y4	294	301	-4.9 (3.3)	-1.7%	(-10.3, 0.4)	0.13
Y5	288	298	-8.7*** (3.3)	-2.9%	(-14.2, -3.2)	0.01
Y6	303	315	-10.6*** (3.8)	-3.4%	(-16.8, -4.4)	0.00
Y7	309	320	-10.7** (4.2)	-3.3%	(-17.6, -3.8)	0.01
Y1–Y7	299	308	-7.2** (3.0)	-2.4%	(-12.1, -2.4)	0.01
Total ED visits, including observation stays						
Baseline	556	580	n.a.	n.a.	n.a.	n.a.
Y1	678	710	-7.4 (5.3)	-1.1%	(-16.1, 1.2)	0.16
Y2	693	723	-5.6 (5.6)	-0.8%	(-14.7, 3.6)	0.32

Table 5.I.4 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Y3	717	755	-14.3** (5.7)	-2.0%	(-23.8, -4.8)	0.01
Y4	709	748	-14.7** (6.2)	-2.0%	(-24.9, -4.4)	0.02
Y5	723	765	-17.4** (7.4)	-2.4%	(-29.7, -5.2)	0.02
Y6	733	776	-19.2** (7.7)	-2.5%	(-31.9, -6.4)	0.01
Y7	742	796	-29.7*** (8.9)	-3.8%	(-44.3, -15.2)	0.00
Y1–Y7	714	755	-16.1*** (5.9)	-2.2%	(-25.8, -6.5)	0.01
Outpatient ED visits, including observation stays						
Baseline	417	441	n.a.	n.a.	n.a.	n.a.
Y1	466	492	-2.1 (4.6)	-0.4%	(-9.7, 5.5)	0.65
Y2	489	515	-2.9 (5.0)	-0.6%	(-11.0, 5.3)	0.57
Y3	503	539	-12.7** (5.2)	-2.5%	(-21.3, -4.1)	0.02
Y4	502	536	-10.9** (5.5)	-2.1%	(-19.9, -1.8)	0.05
Y5	514	548	-11.1* (6.7)	-2.1%	(-22.1, -0.2)	0.09
Y6	515	547	-8.0 (6.7)	-1.5%	(-19.1, 3.0)	0.23
Y7	519	562	-20.0*** (7.6)	-3.7%	(-32.5, -7.6)	0.01
Y1–Y7	502	536	-10.2** (5.1)	-2.0%	(-18.7, -1.8)	0.05

Table 5.I.4 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Medicare expenditures (PBPM)						
Medicare Part A and B expenditures excluding enhanced payments made for CPC Classic, CPC+, or SSP						
Baseline	$574	$578	n.a.	n.a.	n.a.	n.a.
Y1	$774	$796	-$17.8*** ($6.6)	-2.2%	(-$28.6, -$6.9)	0.01
Y2	$802	$817	-$10.5 ($6.9)	-1.3%	(-$21.8, $0.9)	0.13
Y3	$837	$845	-$3.5 ($7.6)	-0.4%	(-$16.0, $9.0)	0.65
Y4	$857	$862	-$1.3 ($8.4)	-0.2%	(-$15.1, $12.4)	0.87
Y5	$905	$915	-$6.4 ($8.4)	-0.7%	(-$20.2, $7.5)	0.45
Y6	$946	$955	-$5.2 ($9.5)	-0.6%	(-$20.8, $10.4)	0.58
Y7	$1021	$1024	$1.2 ($10.2)	0.1%	(-$15.6, $18.0)	0.91
Y1–Y7	$878	$888	-$6.0 ($6.5)	-0.7%	(-$16.8, $4.7)	0.36
Sample sizes						
Number of practices	497	908				
Number of beneficiaries	565,674	1,165,284				
Number of beneficiary years	3,334,698	6,853,200				

Source: Medicare claims data for October 2011 through December 2019.

Notes: Estimates are regression-adjusted for baseline beneficiary characteristics and baseline practice characteristics. We based each estimate on a difference-in-differences analysis, and each reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in intervention practices in Years 1 to 7 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. Note that expenditures and utilization are generally lower in the baseline year (relative to intervention years) because the baseline

Table 5.I.4 *(continued)*

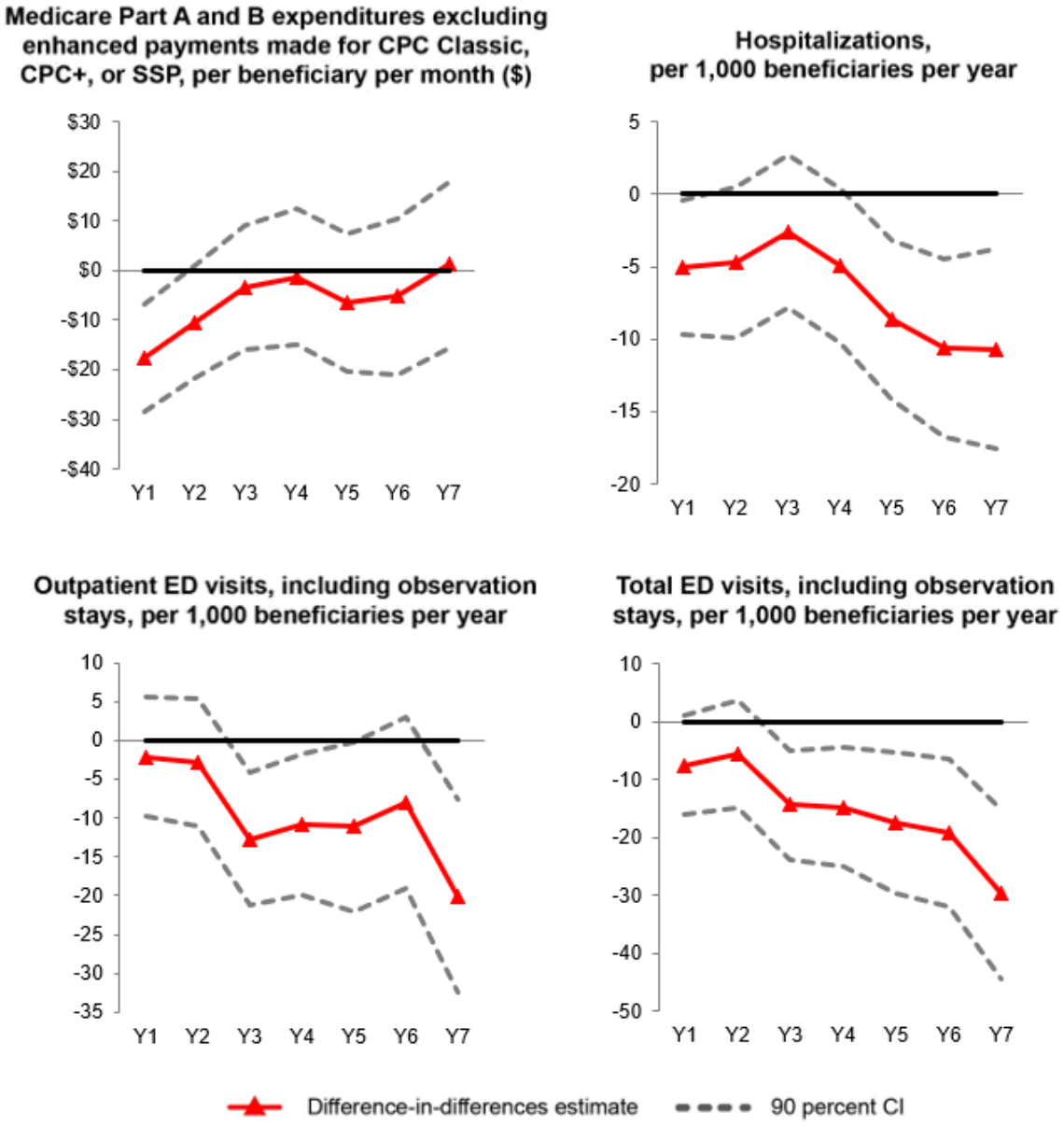
sample was composed of beneficiaries who were attributed (and hence alive) during the intervention period and did not include beneficiaries who needed expensive end-of-life care who would have died during the baseline year.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

[a] To calculate these percentages, we divided the difference-in-differences estimate by the mean for the outcome in the intervention group minus the difference-in-differences estimate.

CPC = Comprehensive Primary Care; CPC+ = Comprehensive Primary Care Plus; ED = emergency department; FFS = fee-for-service; n.a. = not applicable; PBPM = per beneficiary per month; SSP = Medicare Shared Savings Program; SE = standard error; Y = year.

Figure 5.I.2. Estimated effects on expenditures and service use for attributed Medicare fee-for-service beneficiaries for CPC Classic and comparison practices, by year



Source: Medicare claims data for October 2011 through December 2019.

Notes: The estimate of the effect, denoted by a separate triangle for each intervention year in the figure, is equal to the difference in mean outcomes between attributed Medicare FFS beneficiaries in the intervention and comparison group practices in any year since CPC Classic began minus the average difference between the two groups during the baseline period. The estimates are regression adjusted to control for baseline differences in beneficiary and practice characteristics between the intervention and comparison groups. The dashed lines indicate the 90 percent confidence interval.

CI = confidence interval; ED = emergency department; FFS = fee-for-service; SSP = Medicare Shared Savings Program; Y = year.

D. Difference-in-differences estimates for expenditures by service category

To try to understand why reductions in hospitalizations and ED visits did not translate into reduction in Medicare expenditures, we next examined the effects of CPC Classic on specific expenditure categories. Note that expenditures in all categories increased over time for both CPC and comparison practices. We use "reduction(s)" in expenditures as a shorthand below to describe "slower growth" or "relative reductions." We were particularly interested in inpatient and outpatient expenditures because they are most likely to be directly affected by the lower growth in hospitalizations. This analysis showed that there was no impact on inpatient expenditures, despite the impacts on hospitalizations. Also, while outpatient expenditures fell, the size of the reduction was only \$4.9 PBPM ($p < 0.01$), which was offset by small increases in other expenditure categories, such as hospice (Table 5.I.5). Our specific findings include:

- There was no overall effect on inpatient expenditures across the seven years. A statistically significant reduction of 3.5 percent ($p = 0.01$) was observed in Year 1 but there was no reduction in any of the subsequent years.
- Over the seven years, there was a 3.1 percent ($p < 0.01$) reduction in outpatient expenditures. The reductions (ranging from 2.5 percent to 4.6 percent) started in Year 3 and continued through Year 7.
- This is consistent with the slower growth in ED visits in these years. It should be noted, though, that expenditures on ED visits are a small component of total outpatient expenditures.
- There was a 7.6 percent (\$2 PBPM, $p = 0.08$) increase in hospice expenditures over the seven years. The yearly increases were statistically significant in Year 3 (10.5 percent, $p = 0.07$), Year 5 (12.2 percent, $p = 0.01$), and Year 7 (8.8 percent, $p = 0.09$). Both CPC Classic and CPC+ required practices to improve end-of-life planning, which could explain the increase in hospice expenditures for CPC Classic beneficiaries. (Note, however, that hospice expenditures are a small fraction [approximately 3.3 percent] of total Medicare expenditures.)
- There were no overall effects on expenditures on physician services, home health, skilled nursing facilities, or durable medical equipment (DME) over the course of the seven years. Some yearly estimates were statistically significant but there were no consistent patterns. Physician expenditures increased by approximately 2 percent each in Years 4, 5, and 7; home health expenditures decreased by approximately 5 percent each in Years 6 and 7 and by approximately 3 percent in Year 1; skilled nursing facility expenditures decreased by 7 percent in Year 1 and by 6 percent in Year 2; and DME expenditures decreased by approximately 4 percent in Year 3 and 5 percent in Year 4.

Table 5.I.5. Regression-adjusted means and difference-in-differences estimates for expenditures by service categories among attributed Medicare fee-for-service beneficiaries for CPC Classic and comparison practices, annual and seven-year cumulative estimates

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Medicare expenditures (PBPM)						
Inpatient						
Baseline	$197	$192	n.a.	n.a.	n.a.	n.a.
Y1	$287	$292	-$10.4** ($4.3)	-3.5%	(-$17.4,-$3.4)	0.01
Y2	$292	$291	-$3.4 ($4.5)	-1.1%	(-$10.7,$4.0)	0.45
Y3	$299	$295	-$0.8 ($4.4)	-0.3%	(-$8.0,$6.4)	0.85
Y4	$303	$299	-$1.2 ($4.5)	-0.4%	(-$8.6,$6.3)	0.80
Y5	$319	$317	-$2.8 ($4.5)	-0.9%	(-$10.1,$4.5)	0.53
Y6	$321	$316	-$0.3 ($4.9)	-0.1%	(-$8.5,$7.8)	0.95
Y7	$342	$336	$1.0 ($5.4)	0.3%	(-$7.9,$9.9)	0.85
Y1–Y7	$309	$307	-$2.5 ($3.5)	-0.8%	(-$8.3,$3.4)	0.49
Outpatient						
Baseline	$97	$103	n.a.	n.a.	n.a.	n.a.
Y1	$116	$123	-$1.7 ($1.4)	-1.5%	(-$4.0,$0.6)	0.23
Y2	$128	$137	-$2.5 ($1.8)	-1.9%	(-$5.5,$0.4)	0.16
Y3	$138	$148	-$4.0** ($1.8)	-2.8%	(-$7.0,-$1.1)	0.02
Y4	$147	$156	-$3.7* ($2.0)	-2.5%	(-$7.0,-$0.4)	0.06

Table 5.I.5 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Y5	$162	$176	-$7.8*** ($2.6)	-4.6%	(-$12.1,-$3.6)	0.00
Y6	$178	$190	-$5.9** ($2.8)	-3.2%	(-$10.5,-$1.2)	0.04
Y7	$194	$208	-$8.5*** ($3.1)	-4.2%	(-$13.5,-$3.4)	0.01
Y1–Y7	$152	$163	-$4.9*** ($1.7)	-3.1%	(-$7.8,-$2.1)	0.00
Physician						
Baseline	$200	$195	n.a.	n.a.	n.a.	n.a.
Y1	$228	$223	-$0.2 ($1.7)	-0.1%	(-$2.9,$2.6)	0.92
Y2	$233	$229	-$1.3 ($1.8)	-0.5%	(-$4.3,$1.8)	0.49
Y3	$243	$237	$1.6 ($2.0)	0.7%	(-$1.6,$4.8)	0.41
Y4	$252	$242	$4.7** ($2.4)	1.9%	($0.8,$8.6)	0.05
Y5	$258	$249	$4.7* ($2.7)	1.9%	($0.2,$9.2)	0.08
Y6	$268	$261	$2.5 ($3.1)	0.9%	(-$2.7,$7.6)	0.43
Y7	$292	$280	$6.9* ($3.6)	2.4%	($1.0,$12.8)	0.05
Y1–Y7	$253	$246	$2.8 ($2.0)	1.1%	(-$0.4,$6.0)	0.15
Home health						
Baseline	$26	$30	n.a.	n.a.	n.a.	n.a.
Y1	$39	$44	-$1.3** ($0.6)	-3.3%	(-$2.4,-$0.3)	0.03
Y2	$40	$43	$0.8 ($0.7)	2.0%	(-$0.4,$2.0)	0.27

Table 5.I.5 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Y3	$42	$45	$0.3 ($0.7)	0.8%	(-$0.9,$1.6)	0.65
Y4	$41	$46	-$0.4 ($0.9)	-0.9%	(-$1.8,$1.1)	0.68
Y5	$43	$48	-$1.1 ($1.0)	-2.6%	(-$2.7,$0.4)	0.23
Y6	$46	$52	-$2.2** ($1.0)	-4.6%	(-$3.9,-$0.5)	0.03
Y7	$47	$54	-$ 2.7** ($1.0)	-5.4%	(-$4.4,-$1.0)	0.01
Y1–Y7	$43	$47	-$0.9 ($0.7)	-2.1%	(-$2.0,$0.2)	0.18
Hospice						
Baseline	$2	$2	n.a.	n.a.	n.a.	n.a.
Y1	$20	$20	$0.3 ($1.0)	1.7%	(-$1.3,$2.0)	0.74
Y2	$23	$23	$0.4 ($1.3)	1.8%	(-$1.7,$2.5)	0.74
Y3	$25	$23	$2.4* ($1.3)	10.5%	($0.2,$4.6)	0.07
Y4	$27	$26	$2.0 ($1.3)	7.8%	(-$0.2,$4.1)	0.13
Y5	$31	$28	$3.4*** ($1.3)	12.2%	($1.3,$5.5)	0.01
Y6	$35	$34	$2.3 ($1.6)	6.9%	(-$0.3,$4.9)	0.15
Y7	$40	$38	$3.3* ($1.9)	8.8%	($0.1,$6.4)	0.09
Y1–Y7	$29	$27	$2.0* ($1.2)	7.6%	($0.1,$4.0)	0.08
Skilled nursing facility						
Baseline	$30	$32	n.a.	n.a.	n.a.	n.a.

Table 5.I.5 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Y1	$61	$68	-$4.6*** ($1.7)	-7.0%	(-$7.4,-$1.8)	0.01
Y2	$64	$70	-$4.1** ($1.8)	-6.0%	(-$7.0,-$1.2)	0.02
Y3	$68	$72	-$2.1 ($2.0)	-3.0%	(-$5.4,$1.1)	0.28
Y4	$66	$70	-$1.7 ($2.1)	-2.6%	(-$5.1,$1.7)	0.40
Y5	$68	$74	-$2.9 ($2.2)	-4.1%	(-$6.6,$0.7)	0.19
Y6	$71	$77	-$3.4 ($2.5)	-4.5%	(-$7.4,$0.7)	0.17
Y7	$76	$79	-$1.3 ($2.6)	-1.7%	(-$5.6,$3.0)	0.62
Y1–Y7	$68	$73	-$2.9 ($1.8)	-4.0%	(-$5.8,$0.1)	0.11
Durable medical equipment						
Baseline	$23	$23	n.a.	n.a.	n.a.	n.a.
Y1	$25	$26	$0.1 ($0.4)	0.4%	(-$0.5,$0.7)	0.80
Y2	$22	$23	-$0.5 ($0.5)	-2.2%	(-$1.3,$0.4)	0.34
Y3	$23	$24	-$0.9* ($0.5)	-3.8%	(-$1.8,-$0.0)	0.09
Y4	$21	$23	-$1.0* ($0.6)	-4.6%	(-$2.0,-$0.1)	0.08
Y5	$21	$22	-$0.9 ($0.7)	-4.2%	(-$2.0,$0.2)	0.18
Y6	$23	$24	-$0.3 ($0.7)	-1.3%	(-$1.5,$0.9)	0.68
Y7	$25	$27	-$1.2 ($0.9)	-4.4%	(-$2.6,$0.3)	0.18
Y1–Y7	$23	$24	-$0.7 ($0.5)	-2.9%	(-$1.5,$0.1)	0.16

Table 5.I.5 *(continued)*

	Intervention mean	Comparison mean	Difference-in-differences estimate (SE)	Difference-in-differences estimate in percentage[a]	90 percent confidence interval	*p*-Value
Sample sizes						
Number of practices	497	908				
Number of beneficiaries	565,674	1,165,284				
Number of beneficiary years	3,334,698	6,853,200				

Source: Medicare claims data for October 2011 through December 2019.

Notes: Estimates are regression adjusted for baseline beneficiary characteristics and baseline practice characteristics. We based each estimate on a difference-in-differences analysis, and each reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in intervention practices in Years 1 to 7 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. Note that expenditures are generally lower in the baseline year (relative to intervention years) because the baseline sample is composed of beneficiaries who were attributed (and hence alive) during the intervention period and did not include beneficiaries who needed expensive end-of-life care who would have died during the baseline year.

[a] To calculate these percentages, we divided the difference-in-differences estimate by the mean for the outcome in the intervention group minus the difference-in-differences estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 levels, two-tailed test.

FFS = fee-for-service; n.a. = not applicable; PBPM = per beneficiary per month; SE = standard error; Y = year.

5.I.4. Discussion

Results from this analysis provide the first estimates of longer-term effects of primary care transformation on expenditures and service use outcomes. We examined seven years of expenditures and utilization data, combining four years of CPC Classic, followed by the first three years of CPC+ for most practices.

- The intervention reduced growth in hospitalizations over the full seven-year period by 2 percent. This was driven by significant relative reduction that emerged in the fifth year (2.9 percent) and persisted into the seventh year (3.3 percent).
- In addition, the reductions in growth of total ED visits and outpatient ED visits (approximately 2 percent each) that were observed in Years 3 and 4 of the CPC Classic intervention also persisted in the Years 5 through 7.

The temporal pattern of effects on ED visits and hospitalizations is consistent with our expectations about how primary care transformation works—outcomes like ED visits could be easier to improve in the short run, which would explain the quicker emergence of favorable effects, whereas a longer time horizon may be needed to see improvements in outcomes like hospitalizations. Because many CPC Classic practices (85 percent) joined CPC+ in 2017 (and continued participating in 2018) and many of their comparison practices (79 percent) did not join CPC+ in 2017 or 2018, these favorable effects reflect the four years of CPC Classic and the three years of CPC+. We cannot determine how much of the effects are attributable to the lagged effects of CPC Classic versus the additional years of support through CPC+. Although CPC+ was not associated with significant favorable improvement in outcomes (particularly, hospitalizations) in its first three years for all practices that participated (Peikes et al. 2021), it is possible that CPC+ provided important support to continue the work begun in CPC Classic for the CPC Classic practices that joined CPC+.

The estimates in this analysis could underestimate the full extent of the intervention's favorable effect with outcomes for two reasons. First, 21 percent of CPC Classic comparison practices joined CPC+ and although the beneficiaries assigned to these practices potentially benefited from CPC+, they remained in the comparison group in Years 5, 6, and 7. Second, 14 percent of CPC Classic practices did not join CPC+, and although the beneficiaries assigned to them were not affected by CPC+, they remained in the intervention group in the last three years.

Although the relative reductions in hospitalizations in Years 5 through 7 are promising, they did not translate to a discernable relative reduction in Medicare Part A and Part B expenditures. There are two potential explanations. First, despite the relative reductions in hospitalizations in Years 5 through 7, the magnitude of the estimates for inpatient expenditures in these years was small (and not statistically significant). This finding suggests that the avoided hospitalizations were relatively less severe and thus less costly. Second, there were offsetting estimated relative increases in hospice expenditures (in Years 3, 5, and 7) and in physician expenditures (in Years 4, 5, and 7).

Even the effects on hospitalizations and ED use that we do observe are modest in size. It is possible that effects might be larger if primary care practices had stronger incentives or if there

were incentives for other providers (for example, including hospitals and specialists) who care for the same patients. Also, beneficiaries were not rewarded for taking better care of themselves or seeking higher-value providers or services. Finally, comparison practices' outcomes may have improved due to other efforts to transform primary care (for example, through the increase in penalties for high readmission rates); this may have made it difficult for the intervention practices to generate reductions in savings or service use relative to the comparison practices.

This study has three main limitations. First, because the design is not experimental, unobservable differences between the intervention and comparison practices could bias the estimated effects. For example, Daw and Hatfield (2018) show that regression to the mean can lead to bias in studies with comparison group designs (like this one) that match on pre-period outcomes; they also point out that this issue is especially problematic when the difference in outcomes between potential comparisons and selected comparisons is large. However, the average outcome values in the group of potential comparison practices (pre-matching) and selected comparison practices (post-matching) in this study were small, suggesting that regression to the mean is not likely to substantially bias these results (Dale et al. 2016).

Second, due to our intent-to-treat design, some beneficiaries assigned to the intervention group no longer receive the intervention in later follow-up years, potentially leading to attenuation bias.

Finally, findings from CPC Classic and the start of the CPC+ model, with the unique set of practices and patients, may not generalize to other payers, primary care models, or participants with different eligibility requirements, model rules, and supports. Future research should observe these practices for the final two years of CPC+ and test longer-term effects of other primary care transformation models.

5.I.5. Conclusion

The findings from this analysis have important implications for how payers and policymakers should test and assess primary care reform over longer periods. The results suggest that primary care transformation may reduce ED visits quickly, that it could take five years of robust support to reduce hospitalizations, and that reducing total health care spending may require longer or new approaches. More research is needed to follow these practices over the remaining two years of CPC+ and to examine other primary care transformation approaches to see if similar temporal patterns appear.

5.J. Scalability

Key takeaways

In this appendix, we estimate what the impact would be if CMS were to scale up Track 1 of CPC+. Specifically, we generalize the effect of the fourth year of the five-year model, accounting for CPC+ practices potentially not being representative of those in a scale-up. We consider both a *nationwide scale-up* and a *targeted scale-up* to practices where the intervention would be most likely to generate savings. We estimate these scale-up impacts using individualized weighted Bayesian Causal Forests (iBCF). Through its flexible modeling of impact heterogeneity, iBCF can estimate impacts of scaling up to policy-relevant populations; through its data-driven discovery of subgroups, it can identify the populations expected to benefit most from an intervention. Our key findings are:

- Although there is almost no chance a nationwide scale-up of Track 1 would be cost-neutral, a scale-up targeted to Medicare Shared Savings Program (SSP) practices (based on the definition of SSP as of January 1, 2017) would likely generate sufficient savings to offset care management fees (79 percent probability).
- Furthermore, we estimate both nationwide and targeted Track 1 scale-ups would reduce outpatient emergency department visits and acute hospitalizations with high probability.
- A scale-up targeted to SSP practices would reduce Medicare expenditures excluding enhanced CPC+ payments by an estimated $25 per beneficiary per month (90 percent credible interval -$47 to -$2), generating aggregate savings of about $228 million per year.

However, while our analysis extrapolated CPC+ impacts geographically, it did not tackle the harder challenge of extrapolating impacts forward in time: we assessed the impact of CPC+ *as it was offered in PY 4.* Furthermore, a practical challenge of implementing our recommended targeted scale-up to SSP practices is that SSP has changed since 2017; although our recommendation relies on our highly favorable estimate of impacts among 2017 SSP practices, 2022 SSP practices would not necessarily achieve the same impacts. Preliminary findings indicate that no targeted Track 2 scale-ups show promise at this time. This appendix details methods, their assumptions, full results, sensitivity analyses, and limitations of the scalability analysis.

5.J.1. Introduction

In this Appendix, we estimate what the impact would be if CMS were to scale up Track 1 of CPC+, focusing on three key outcomes: (1) total Medicare expenditures without enhanced CPC+ payments, (2) outpatient emergency department (ED) visits including observation stays, and (3) acute hospitalization rates. Although the model has not yet shown favorable overall impacts on expenditures for the practices that joined in 2017, scaling up to a set of practices with a different profile of practice and patient characteristics might show different effects. We consider both a *nationwide scale-up* to all practices that would be eligible in the United States across both CPC+ regions and new regions and a *targeted scale-up* to practices in which the intervention would be most likely to generate savings. We focus on Track 1 as an illustrative example given computational challenges encountered when analyzing Track 2; preliminary findings indicate that no targeted Track 2 scale-ups show promise at this time.

The primary CPC+ impact analysis provides reliable estimates of CPC+'s effects in the *evaluation sample;* that is, among the set of practices that began participating in CPC+ in 2017. CMS selected regions and then practices in those regions that were motivated to apply to the model and met CMS's eligibility criteria. However, this set of practices might not be representative of the eligible practices that would volunteer for a scale-up: that is, the *projected scaled sample* that would represent the target population.

Evaluation sample: practices that participated in Track 1 of CPC+

Projected scaled sample: practices that would be eligible and would volunteer to participate in a scale-up

As a result, we cannot interpret the evaluation sample's impact estimate (presented in Chapter 5) as the impact we would expect to observe if CPC+ were scaled up. To gauge the effects of CPC+ on a larger scale, we need to account for differences in practice and patient characteristics between the evaluation sample and the projected scaled samples—namely, differences in characteristics that modify the effect of CPC+. For example, if CPC+ generated the largest savings among practices participating in the Medicare Shared Savings Program (SSP) and if the proportion of practices that participate in SSP differs between the evaluation sample and the projected scaled sample, we would expect average CPC+ impacts under a scale-up to differ from those in the evaluation. Thus, even when the impact evaluation has appropriately dealt *with internal validity biases* (confounding and other factors that could bias in-sample estimates of the effects of CPC+ for the evaluation sample), to recover the true impacts in the scale-up, we still need to address *external validity biases* (differences in practice and beneficiary characteristics that could bias out-of-sample estimates of the effects of CPC+).

"We cannot interpret the evaluation sample's impact estimate as the impact we would expect to observe if CPC+ were scaled up, because the evaluation sample and projected scaled sample might differ on characteristics that modify the effect of CPC+."

To address the discrepancy between the evaluation sample and projected scaled samples and extend impact results beyond the evaluation at hand, we must use generalizability methods. These methods have attracted increasing attention, resulting in approaches that use outcome regressions such as ordinary least squares models or Bayesian Additive Regression Trees (BART; Hill 2011; Green and Kern 2012; Kern et al. 2016), propensity of selection weighting approaches (Cole and Stuart 2010; Correa et al. 2018), and double-robust estimators such as the Targeted Maximum Likelihood Estimator (Rudoph and van der Laan 2017) and augmented inverse probability weighting (Dahabreh et al. 2019). However, other than BART, most approaches have relied on parametric modeling assumptions that relationships between covariates and the outcome are linear and additive. Few existing approaches allow for flexible modeling, which is particularly important when generalizing results from large observational studies with many confounders and effect modifiers, studies in which the true relationships between covariates and the outcome are unknown and cannot easily be captured through simple linear additive relationships.

The CPC+ scalability analysis requires additional considerations novel to the generalizability literature. Because scale-up participation would remain voluntary, the projected scaled samples are uncertain: it is unclear which practices would be eligible and would volunteer for a scale-up.

Although there is a large literature on scale-up implementation considerations (Barker et al. 2016; Powell et al. 2015; World Health Organization 2010), and several approaches exist for estimating impacts of a policy model scale-up (Attanasio et al. 2003; Flores and Mitnik 2013; Gechter 2015), no literature to our knowledge addresses generalizability to a projected scaled sample that is not enumerable (due to uncertainty as to which practices would volunteer for the scaled-up intervention in new geographic regions).

To address these shortcomings, we present a novel approach that uses nonparametric outcome regressions called Bayesian Causal Forests (BCF) for extending inference from the CPC+ evaluation sample to the projected scaled sample, while accounting for effect heterogeneity across different types of practices in a data-driven fashion. BCF has shown superior performance compared to other causal estimators for confounding adjustment (Hahn et al. 2014). It is particularly well suited for extension to projecting generalized effects as it explicitly considers and accounts for both confounding (the key threat to internal validity) and heterogeneous treatment effects (the key threat to external validity). Specifically, we used a version of BCF called individualized weighted BCF (iBCF), which does not require that measured characteristics wholly explain impacts.

As Bayesian estimators, BCF methods (including iBCF) allow for incorporating additional sources of uncertainty into the credible intervals, such as uncertainty about what will drive participation in new geographic regions. Incorporating this source of uncertainty into the final Bayesian credible intervals will avoid overstating confidence in estimated scale-up effects. Thus, our point estimates and confidence intervals directly capture uncertainty as to which practices will volunteer for a scale-up. We address additional sources of uncertainty in sensitivity analyses, namely uncertainty regarding unmeasured effect modifiers such as motivation to improve care and uncertainty regarding adjusting for confounding by COVID-19. In this analysis, we assessed the long-term impact of a scale-up of Track 1 of CPC+ *as it was offered during the evaluation,* through Program Year (PY) 4. This approach limits the extent to which our scale-up estimates can serve as *prediction*s of what would happen in a future scale-up, because implementation of CPC+ would undoubtedly change under scale-up. Instead, our estimates can be more precisely thought of as providing an accurate *retrospective* estimate of what the impact would have been had CPC+ been offered nationwide in 2017. We consider this limitation in more detail in the Discussion section.

Furthermore, a practical challenge of implementing targeted scale-up approaches is that practice baseline characteristics have changed since they were assessed before the evaluation began; for example, the set of practices participating in SSP today differs from the set that participated in 2017. Our analysis does not incorporate uncertainty around extrapolating *practice characteristics* forward in time. The Discussion section considers this and additional limitations.

To obtain scale-up estimates, the analysis proceeded in four steps:

1. For the nationwide and targeted scale-ups, we first estimated which eligible practices would participate.
2. Next, we used iBCF to estimate the impact of CPC+ in fine-grained subgroups within the evaluation sample of Track 1 CPC+ practices and their matched comparison practices.

3. Using the iBCF fitted regression, we predicted CPC+'s impact in the projected scaled samples.
4. Finally, we assessed sensitivity of these predicted scaled impact estimates to assumptions.

5.J.2. Methods

The scalability analysis addressed what would happen if, at the end of the evaluation period, CMS were to scale up CPC+ compared to if it were to discontinue the model. The outcomes of interest were total Medicare expenditures without enhanced CPC+ payments, outpatient ED visits including observation stays (because we expect CPC+ to affect ED visits before other outcomes), and acute hospitalization rates. We examined the causal impact for Track 1 of CPC+, as implemented in practices that joined CPC+ in 2017. Specifically, we estimated the effects of both a *nationwide scale-up* and a *targeted scale-up* to practices in which the intervention would be likely to generate savings. The nationwide scale-up explored scaling up to all eligible practices nationwide that would volunteer, across both CPC+ regions and new regions. Practice-targeting scale-ups explored scaling up to practice types in which iBCF estimates total Medicare expenditure savings from CPC+ to offset care management fees (CMFs).

Step 1. Identify CPC+-eligible practices nationwide that would participate

Within CPC+ regions, practices could volunteer for one of two model tracks. The model enrolled all volunteering practices that met eligibility requirements. Because a nationwide scale-up would remain voluntary for practices that meet eligibility requirements, we had to identify practices that would be eligible for CPC+ and were likely to volunteer to participate. These eligible volunteering practices—either nationwide or among targeted practices—represent the projected scaled samples to which we wish to generalize impacts of the CPC+ model.

The first step in determining the projected scaled samples was to create a national data set of primary care practices in the United States with data on practice- and market-level characteristics; we also used this national data set to select comparison practices. The data set contained all practices in the United States with at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a primary care specialty (defined as family practice, general practice, geriatrics, or internal medicine). We purchased yearly rosters from IQVIA, a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the country, including practices' names and addresses along with the name, specialty, and National Provider Identifier (NPI) of each practitioner at the practice site. We then added practice and market characteristics from multiple sources, including publicly available data (e.g., Area Resource File); CMS restricted-use data (e.g., Master Data Management); and proprietary data (e.g., National Committee for Quality Assurance data) (described in Table 5.J.1). To identify the characteristics of patients at each practice, namely demographic characteristics and health care use and risk characteristics of all Medicare fee-for-service (FFS) beneficiaries assigned to practices before CPC+ began, we used Medicare claims and enrollment data. We defined each practice's Medicare FFS population in the baseline period as the beneficiaries attributed to that practice (based on the visits they made to health care practitioners in the 24 preceding months) in the first quarter of 2016, or in any subsequent quarter of the baseline year if they have not previously been attributed to a practice. We measured all characteristics using the most recent data available before CPC+ began, so CPC+

did not affect them. Further details are available in Singh et al. (2020). A small portion of practices (3.2 percent) were missing values for at least one covariate; we imputed these values from data on all primary care practices.

A. Determining eligibility

To determine which primary care practices in the United States would be eligible for a CPC+ scale-up, we approximated the claims-based eligibility criteria but not CPC+ care delivery requirements, as CMS determined care delivery criteria based on practices' applications, which were not available for practices nationwide (Table 5.J.1). The main impact analysis also used this approach of approximating application-based criteria using the Medicare claims and other administrative data to narrow the set of potential comparison practices before conducting matching (Peikes et al. 2021).We deemed practices nationwide to be eligible if they provided primary care, at least 9.25 percent of their billed charges were for primary care services, they were not federally qualified health centers or rural health clinics, they were not participating in a Next Generation Accountable Care Organization (ACO) model as of January 2017, and they had more than 50 assigned Medicare FFS beneficiaries at the start of CPC+ (for stability of aggregate patient characteristics). These criteria differ from eligibility requirements CMS used due to the need to rely on data sources available for all practices nationwide to construct practice characteristics and attribute beneficiaries to practices; we could not rely on the data CMS used to assess eligibility and conduct attribution because those data were available only for CPC+ practices (Table 5.J.1). Because we did not account for care delivery requirements, it is likely we considered more practices nationwide as eligible than would truly meet all CPC+ eligibility requirements (e.g., 19 percent of CPC+ applicants did not meet one or more care delivery requirements). We did not apply the eligibility criterion of sufficient revenue from Medicare and other CPC+ payers, as CMS might not consider restricting practices based on payer alignment. Furthermore, because CMS provided 96 percent of unique funding for CPC+ practices in PY 4, payer alignment is likely to have had minimal impact on the model.

Table 5.J.1. Data sources to determine CPC+ eligibility in national sample

CMS eligibility criterion	Evaluation's modified criterion	Data source
Criteria we could approximate		
Primary care practice		SK&A 2016[a]
At least 40 percent of Medicare FFS services billed by the primary care practitioners are for primary care	> 9.25 percent primary care billing percentage[b]	Medicare claims data 2016
Not an FQHC or RHC		Provider of Service file 2016[c]
Not in Medicare shared savings aside from SSP (not in Next Generation ACO Model) on January 1, 2017		MDM 2017[d]
At least 125 Medicare beneficiaries attributed	> 50 Medicare beneficiaries attributed[e]	Medicare enrollment data 2015–2017; Medicare claims data 2014–2016
Uses CEHRT		Assumed 100%[f]
Criteria we could not approximate		
At least 45% of revenue comes from Medicare and CPC+ payer partners		Will no longer be an eligibility criterion
Patients assigned to provider panel		Unavailable
Patients have 24/7 access to a care team practitioner		Unavailable
Nonphysician team members deliver clinical care		Unavailable
Quality improvement activities		Unavailable

[a] We removed practices from the pool that we considered ineligible for CPC+ due to their intended patient populations. Specifically, we manually removed all practices that appeared to be specialty clinics (for example, surgery clinics, Planned Parenthood clinics, or urgent or emergency care clinics). We also removed practices with a practice specialty other than primary care, limiting the sample to the following eight specialties: (1) adolescent medicine, (2) family medicine, (3) geriatric medicine, (4) general practice, (5) internal medicine and pediatrics, (6) internal medicine, (7) multispecialty, and (8) pediatrics. (Pediatricians are not considered primary care physicians for CPC+. However, some practices with pediatric specialties participate in CPC+, because they have at least one practitioner with a primary care specialty; therefore, we included practices with pediatric or other specialties in our potential comparison sample as long as they had at least one practitioner with a nonpediatric primary care specialty.)

[b] The minimum billing percentage observed for CPC+ practices was 9.25 percent; under the methods used by the evaluation, some CPC+ practices had lower billing percentages than the eligibility threshold because the evaluation computed the billing percentage using different data sources and a slightly different attribution algorithm than CMS.

[c] We did not assess FQHC and RHC status for all practices but rather, at the time of analysis, we assessed this status only for practices selected to be comparison practices in an initial round of matching. FQHCs and RHCs could therefore still remain in noncomparison practice regions, though the minimum attributed beneficiary requirement makes it unlikely there were many.

[d] Next Generation ACO model participation status was missing for some practices (less than 1 percent of practices); we assumed these practices met eligibility requirements.

[e] We did not require at least 125 attributed beneficiaries due to differences between the attribution algorithms and data sources we used for the evaluation compared to those CMS uses for payment. Instead, we required more than 50 attributed beneficiaries for stability of aggregate patient characteristics, such as hospitalizations and Medicare expenditures.

[f] Due to the increase in EHR use over the past decade, including a requirement that all practices billing to Medicare use CEHRT, we conservatively assumed all practices would meet the CEHRT criterion at the end of the evaluation period.

ACO = Accountable Care Organization; CEHRT = Certified Electronic Health Record Technology; CMS = Centers for Medicare & Medicaid Services; ED = emergency department; EHR = electronic health record; federally qualified health center = FQHC; FFS = fee-for-service; MDM = master data management system; rural health clinic = RHC; SSP = Medicare Shared Savings Program.

B. Determining which practices would volunteer

CPC+ is a voluntary model, with 15 percent of all practices in CPC+ regions having participated in the model. These participating practices were not representative of broader primary care practices in their region. For example, CPC+ practices were more likely to have patient-centered medical home recognition, be in SSP, have meaningful use of an electronic health record (EHR), be owned by a system or hospital, and be larger than all practices providing primary care in their regions. The beneficiaries they served were slightly healthier and less disadvantaged than those whom all primary care practices in the CPC+ regions served (Singh et al. 2020).

Similarly, practices in an expanded voluntary model will not be representative of practices nationwide. To estimate which practices would volunteer to participate nationwide, we identified characteristics that drove eligible practices to participate in the 14 geographic regions that had already implemented CPC+ in 2017. We did so by fitting a propensity score model for volunteering to participate in Track 1 or 2 among eligible practices in the 14 geographic regions, using multinomial BART. Then, we used the fitted model to predict the propensity that each eligible practice nationwide would volunteer for a scale-up of Track 1 or 2. We used the predicted propensities to participate in Track 1 as weights in subsequent steps of this analysis, such that practices nationwide that had higher predicted propensity to participate in a Track 1 scale-up received more weight in our estimate of the scaled-up impact. We incorporated uncertainty from estimating the weights into the uncertainty intervals around our estimate of the scaled-up impact.

C. Targeting practices

Instead of scaling up CPC+ nationwide, CMS could restrict the scale-up to types of practices in which CPC+ would be most likely to generate savings. Namely, a practice targeting scale-up could target the subgroup of practices in which favorable impact estimates are most highly concentrated. Specifically, we first assessed which practice characteristic(s) best distinguish high- from low-impact practices using Classification and Regression Trees; these impacts are estimated in Steps 2 and 3. Then, if continuous variables defined high-impact practices, we determined thresholds for those characteristics to use as eligibility criteria for the practice-targeted scale-up, such that estimated savings would be large enough to offset CMFs, which are $15 per beneficiary per month (PBPM) for Track 1. We considered two candidate projected scaled samples, corresponding to a nationwide and a practice-targeted scale-up.

Step 2. Estimate impact of CPC+ in fine-grained subgroups in the evaluation sample

In this step, we fitted an iBCF regression to the evaluation sample (CPC+ practices) and their matched comparison practices in Track 1 to estimate CPC+ effects across different types of practices. Specifically, we fitted a practice-level model (rather than a beneficiary-level model, to ensure computational tractability) that included the practice's average pre-period outcome as an independent variable (rather than as a dependent variable, as is the case in the frequentist difference-in-differences (DD) regressions presented in Chapter 5). The regression was similar to that used for the BCF impact analysis included in the second annual report (Appendix 6.I to Anglin et al. 2020), with four key differences:

iBCF is an extension to the second annual report's weighted BCF (wBCF); iBCF's improvements overcome wBCF's known undercoverage problem (Dorie et al. 2019): unlike wBCF, iBCF's credible intervals achieve nominal ("as advertised") coverage. They do so by adding two practice-level random effects to the regression, corresponding to impact and prognostic components. These respective random effects allow for measured covariates to not wholly explain treatment effects and untreated potential outcomes.

Characteristics adjusted for in the iBCF regression differed somewhat from those used by wBCF in the second annual report. Compared to the second annual report's wBCF impact analyses, the current iBCF scalability analysis used a subset of beneficiary- and practice-level covariates used by wBCF. Namely, iBCF scalability analysis did not include characteristics that had not been constructed in the full national data set: some chronic condition combinations, a practice-level estimate of CMF payments, and the proportion of beneficiaries assigned a new enrollee hierarchical condition category (HCC) score (i.e., for whom we calculated an HCC score on the basis of demographic characteristics only). Furthermore, for PY 4 analyses, following the approach used in the main DD impact analysis, we adjusted for region-level control variables to account for potential confounding and impact heterogeneity due to COVID-19 (see Appendix 5.C for further details).

To provide insight into the long-term effects of a scale-up, we analyzed PY 4 outcomes. We did not include PY 1 through 3 outcomes because we expect effects to emerge in the later years of the intervention, but we also compared PY 4 results to separately-fit PY 3 impact estimates to assess trends. Based on estimates of the longer-term effects of CPC Classic (Appendix 5.F to Peikes et al. [2021]) and previous literature on primary care transformation, we expect impacts on all outcomes could continue to improve over the final year of model implementation. We therefore plan to update this analysis next year with PY 5 outcomes, when practices have had further opportunity to improve care and patient outcomes.

The regression's dependent variable was the practice's pre- and post-intervention difference in average outcomes ($\bar{y}_{post} - \bar{y}_{pre}$), instead of the post-period average outcome ($\bar{y}_{post}$). Using the pre- and post-intervention difference "shrinks toward" DD estimates while not presuming that baseline outcomes perfectly correlate with post-intervention outcomes.

Step 3. Use fitted iBCF model to estimate CPC+ impact in projected scaled samples

In Step 3, we estimated causal effects of Track 1 of CPC+ in each of the two projected scaled samples. We used the iBCF outcome regression fit on the evaluation sample to compute a treatment effect estimate for each eligible practice in the projected scaled samples. The beneficiary-level population average treatment effects in each projected scaled sample are the propensity-for-volunteering and practice-size weighted averages of these estimated treatment effects. The propensity-for-volunteering weights are the predicted propensities for volunteering estimated in Step 1, and the practice-size weights enable larger practices to contribute more to the final estimates.

Step 4. Assess sensitivity to assumptions

In the final step, we assessed how much our estimates of the impact of scaling up the CPC+ model might change due to (1) unmeasured effect modification and (2) confounding by COVID-19. Table 5.J.2 describes the sensitivity analyses we performed to address these two key sources of scale-up uncertainty.

Table 5.J.2. Sensitivity analyses

Sensitivity test	Motivation
A. Unmeasured effect modification	
Instead of assuming "no unmeasured effect modifiers," we assessed unmeasured effect modification as strong as (1) the strongest measured effect modifier bias, a worst-case scenario; and (2) the second-strongest effect modifier bias, a next-to-worst-case scenario.	This scalability analysis relies on canonical untestable assumptions related to internal and external validity (Degtiar and Rose 2021).* The *internal validity* assumptions are not unique to this scalability analysis—they also underpin the impact estimates for the evaluation sample presented in Chapter 5; we did not assess sensitivity to those assumptions in this scalability analysis. The canonical *external validity* assumptions, sometimes termed *heroic* (Stuart et al. 2018), are novel to the scalability analysis. Of external validity assumptions, we expect this analysis to be most vulnerable to the assumption of *no unmeasured effect modification,* namely, that administrative data and secondary data used in the evaluation have captured all relevant factors by which CPC+ impacts differ and that differ between evaluation sample and projected scale sample practices. However, the projected scaled samples could meaningfully differ from the evaluation sample in factors such as **practices' motivation to improve patient care, baseline approaches to primary care delivery, and the payer landscape.** However, because CMS is the primary driver of CPC+ changes (with Medicare FFS accounting for 69 percent of total CPC+ enhanced payments and CMS providing 96 percent of the unique funding for CPC+ practices in PY 4), payer considerations are likely to have minimal impact on CPC+ effects.
B. Confounding by COVID-19	
Rather than adjusting for the COVID-19 control variables, we removed these variables from the regression, both as potential confounders and effect modifiers.	The COVID-19 control variables included in this analysis are the same as those used in the primary impact analysis. To understand how iBCF's flexible regression approach incorporates the regionally defined COVID-19 control variables, we assessed how estimates and credible interval widths changed when removing these COVID-19 control variables. On the one hand, iBCF's flexibility enables it to control more fully for confounding by COVID-19. But this flexibility can also create collinearity (near-perfect alignment) between the regionally varying COVID-19 control variables and the regional variation in treatment status. For example, whereas the main DD regression adjusted for linear effects of excess mortality due to COVID-19, iBCF's trees could split on excess mortality to create a nonlinear function that separates CPC+ practices in one region from their matched comparison practices in a neighboring region. In this case, the nonlinear function would be collinear with treatment status. Such collinearity could create a challenge for iBCF in distinguishing between treatment and confounding effects, which can increase the credible interval width. This sensitivity analysis assessed the extent to which iBCF's flexible adjustment for COVID-19 control variables led to (potentially appropriately) widened credible intervals.

*The full list of internal validity, external validity, and projected scaled samples assumptions and their implications for this analysis are as follows:

Internal validity assumptions

No unmeasured confounding with respect to treatment assignment. The CPC+ evaluation was not subject to unmeasured confounding: we adjusted for all variables that risk inducing internal validity bias if not appropriately accounted for.

Positivity of treatment assignment. All practices in the CPC+ evaluation had a positive probability of being in the CPC+ model.

Stable unit treatment value assumption (SUTVA) for treatment assignment. Practices did not affect each other's outcomes and hence there is not nor will there be an added benefit or detriment from being in the same region as an

Table 5.J.2 *(continued)*

existing CPC+ participant; although practices might have individually made different changes and received different payments as a result of participating in CPC+, the CPC+ model is well defined for all practices.

External validity assumptions

SUTVA for evaluation sample selection. Potential outcomes are not a function of how many practices are in the CPC+ model (no general equilibrium effects), practices will adopt the two tracks in similar ratios as we saw in the evaluation sample, the scale-up CPC+ model will not differ from the evaluation model (implementation by practices will remain the same), the same outcome relationships with covariates will hold in the scale-up, evaluation study participants will see annual benefits similar to those observed to date, and if CMS terminates the CPC+ model, these participants would revert to their pre-CPC+ outcomes.

No unmeasured confounding with respect to evaluation sample selection. There are no unmeasured effect modifiers related to being in one of the 14 geographic regions that implemented CPC+. Thus, we can expect new enrollees in the scale-up to benefit to a similar degree as evaluation CPC+ participants with similar measured characteristics. Sensitivity Analysis A assesses robustness of our estimates to violations of this assumption.

Positivity of sample selection. Eligible volunteering practices nationwide could have been in the CPC+ evaluation had it been implemented in their geography.

Projected scaled samples assumptions

Equivalent drivers of volunteering. Measured characteristics will determine which practices will volunteer for the scale-up in a similar way as they determined practice participation in CPC+ regions.

Invariant practice characteristics. Practice characteristics have not changed from the baseline period (2016–2017).

CMF = care management fee; CMS = Centers for Medicare & Medicaid Services; CPC+ = Comprehensive Primary Care Plus; FFS = fee-for-service; PY = program year.

5.J.3. Results

Step 1. Identify CPC+-eligible practices nationwide that would participate

Of the 80,425 national primary care practices, we estimated 48,746 (61 percent) would be eligible to participate and, of eligible practices, about 4,938 (10 percent) would volunteer for Track 1 (Figure 1)—a similar proportion of practices as volunteered for Track 1 in CPC+ regions (12 percent).

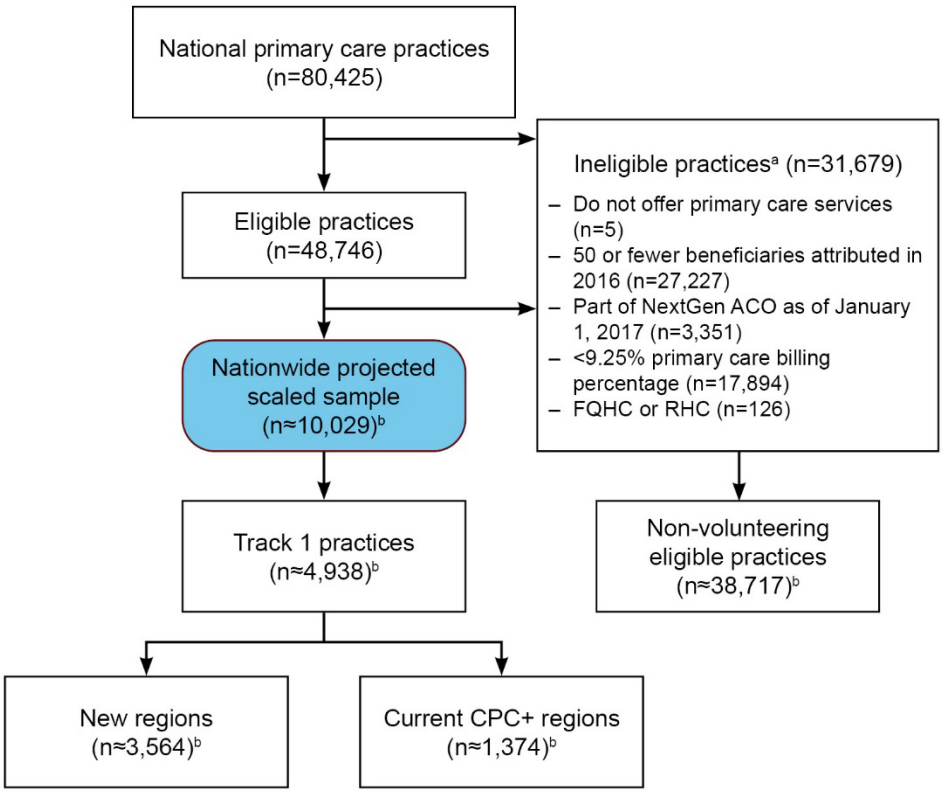
Table 3 details the key differences between the evaluation sample, the projected scaled sample for a nationwide expansion of CPC+, and the remaining eligible practices in the United States we estimate would not volunteer for a nationwide scale-up.

Specifically, the practices that would be eligible and would volunteer for a nationwide scale-up of Track 1 differ as follows:

- **Compared to nonvolunteering eligible practices.** We estimated the nationwide projected scaled sample would have more assigned Medicare FFS beneficiaries on average compared to nonvolunteering eligible practices (667 versus 417) and would be more likely to be owned or managed by a health system or hospital (53 versus 30 percent), more likely to have meaningfully adopted EHR earlier (71 versus 49 percent adopted in 2011–2012), and more likely to have primary care transformation experience (35 versus 18 percent). We also estimated the nationwide projected scaled sample would have lower baseline expenditures ($898 versus $978), fewer acute care stays (283 versus 309 annually per 1,000 beneficiaries), and fewer ED visits (512 versus 557 annually per 1,000 beneficiaries). These practices would be more likely to have participated in an SSP than nonvolunteering practices (55 versus 33 percent). Notably, this latter factor modifies the effect of CPC+, making it key for understanding impacts under a scale-up.

- **Compared to the evaluation sample.** The nationwide projected scaled sample was similar to the evaluation sample with respect to the main effect modifier (SSP status), thus suggesting effects under a nationwide scale-up would likely not differ markedly from effects in the evaluation sample. Compared to evaluation sample practices, nationwide projected scaled sample practices had less experience with primary care transformations (35 versus 47 percent), served slightly more disadvantaged populations (17 versus 15 percent of beneficiaries were dually eligible) and had different geographic distributions (e.g., 25 versus 15 percent in the South and 31 versus 38 percent in the Midwest). They were similar in size (an average of four primary care physicians for both) and served patients of similar risk (average normalized HCC score of 1.0 for both).

Figure 5.J.1. Number of primary care practices in the United States, by eligibility and projected decision to volunteer for a nationwide CPC+ scale-up



[a] The sample size for each reason for ineligibility includes practices excluded for multiple reasons.

[b] Approximate sample sizes are based on mean propensities to volunteer for each track.

ACO = Accountable Care Organization; CPC+ = Comprehensive Primary Care Plus; FQHC = federally qualified health center; n = number; RHC = rural health clinic.

Table 5.J.3. Comparison of characteristics of the Track 1 evaluation sample, nationwide projected scaled sample, and eligible practices not in the nationwide projected scaled sample, with the key factor driving differences in outcomes between practices in bold

Characteristic	A. Evaluation sample (n = 1,373)	B. Projected scaled sample (n ≈ 4,938)[a]	C. Eligible practices not in the projected scaled sample (n ≈ 43,808)[a]	Difference (B–C)
Practice characteristics				
Number of primary care practitioners, mean[b]	4.2 (0.1)	4.5 (0.0)	3.2 (0.0)	1.3 (0.0)
Practice has nurse practitioners or physician assistants, %	50.4 (1.3)	52.5 (0.3)	41.7 (0.2)	10.7 (0.3)
Multispecialty practice, %	12.2 (0.9)	14.0 (0.2)	10.8 (0.1)	3.1 (0.2)
Owned (or managed) by a health system or hospital, %	52.7 (1.3)	53.4 (0.3)	29.9 (0.2)	23.5 (0.3)
Participation in a Medicare SSP ACO as of January 1, 2017, %	**53.8 (1.3)**	**54.6 (0.3)**	**33.1 (0.2)**	**21.5 (0.3)**
Selected primary care transformation experience, %[c]	47.3 (1.3)	34.7 (0.3)	18.4 (0.2)	16.4 (0.2)
EHR meaningful adoption 2011–2012, %[d]	71.5 (1.2)	71.3 (0.3)	48.6 (0.2)	22.7 (0.3)
Characteristics of Medicare FFS beneficiaries attributed to practices at baseline (2016)				
Number of attributed Medicare FFS beneficiaries at baseline, mean	638.9 (16.1)	666.6 (4.9)	416.9 (2.2)	249.7 (3.0)
Medicare expenditures per beneficiary ($/month), mean	887.2 (5.6)	897.7 (1.3)	978.5 (1.8)	-80.8 (2.1)
Acute care stays per 1,000 beneficiaries (annualized), mean	288.5 (2.4)	283.0 (0.5)	309.3 (0.6)	-26.3 (0.7)
ED visits per 1,000 beneficiaries (annualized), mean	512.3 (6.1)	512.3 (1.3)	556.7 (1.4)	-44.4 (1.6)
Normalized HCC score among beneficiaries assigned in the baseline year, mean[e]	1.0 (0.0)	1.0 (0.0)	1.1 (0.0)	0.0 (0.0)
Beneficiary age, mean	71.3 (0.1)	71.5 (0.0)	70.9 (0.0)	0.6 (0.0)
Percentage of beneficiaries with Black race, %	6.5 (0.3)	7.2 (0.1)	10.8 (0.1)	-3.6 (0.1)
Percentage of beneficiaries with White race, %	85.7 (0.5)	85.2 (0.1)	79.7 (0.1)	5.5 (0.1)
Percentage of beneficiaries with who are male, %	41.3 (0.2)	41.6 (0.1)	42.3 (0.0)	-0.7 (0.1)
Percentage of beneficiaries with age as original reason for Medicare entitlement, %	77.8 (0.3)	78.5 (0.1)	75.2 (0.1)	3.4 (0.1)
Percentage of beneficiaries who were dually eligible, %[f]	14.8 (0.4)	16.8 (0.1)	22.0 (0.1)	-5.2 (0.1)
Characteristics of practices' geographic location				
South region, %[g]	14.9 (1.0)	25.3 (0.3)	39.9 (0.2)	-14.6 (0.3)
Midwest region, %[g]	37.7 (1.3)	31.0 (0.3)	20.5 (0.2)	10.4 (0.2)
Northeast region, %[g]	30.8 (1.2)	24.6 (0.3)	21.1 (0.2)	3.5 (0.2)

Table 5.J.3 *(continued)*

Characteristic	A. Evaluation sample (n = 1,373)	B. Projected scaled sample (n ≈ 4,938)[a]	C. Eligible practices not in the projected scaled sample (n ≈ 43,808)[a]	Difference (B–C)
West region, %[g]	16.6 (1.0)	19.2 (0.3)	18.5 (0.2)	0.7 (0.2)
HRR price index (measure of relative costs in the HRR)	1.1 (0.0)	1.1 (0.0)	1.1 (0.0)	0.0 (0.0)
Median household income in the county where the practice is located	58,118.1 (420.5)	58,077.5 (99.8)	56,048.6 (70.7)	2,028.9 (87.4)
Suburban location, %	17.4 (1.0)	18.9 (0.3)	14.4 (0.2)	4.4 (0.2)
Urban location, %	72.8 (1.2)	71.8 (0.3)	75.5 (0.2)	-3.7 (0.2)
Rural location, %	9.8 (0.8)	9.4 (0.2)	10.1 (0.1)	-0.7 (0.2)
Percentage of 25+-year-old individuals in practice county with 4 years of college education	30.9 (0.3)	30.5 (0.1)	29.4 (0.0)	1.1 (0.1)
Percentage of residents in practice county below poverty level in 2014	13.9 (0.1)	14.2 (0.0)	15.5 (0.0)	-1.3 (0.0)
Number of beds per population	30.4 (0.5)	30.7 (0.1)	31.2 (0.1)	-0.5 (0.1)
Medicare Advantage penetration rate, %	28.9 (0.3)	27.7 (0.1)	30.7 (0.1)	-3.1 (0.1)
COVID-19 characteristics				
Wave 2 excess deaths[h]	2.56 (2.04)	3.74 (3.19)	4.92 (4.28)	-1.18 (0.02)
Wave 2 pandemic vulnerability index[h]	0.50 (0.05)	0.51 (0.06)	0.53 (0.05)	-0.02 (<0.01)
Wave 2 maximum excess deaths[h]	0.03 (0.17)	0.09 (0.28)	0.18 (0.38)	-0.09 (<0.01)
Wave 3 pandemic vulnerability index[h]	0.52 (0.05)	0.52 (0.05)	0.53 (0.05)	-0.01 (<0.01)
Wave 1 pandemic vulnerability index[h]	0.47 (0.05)	0.47 (0.05)	0.48 (0.05)	-0.01 (<0.01)
Social vulnerability index[h]	0.44 (0.27)	0.46 (0.27)	0.52 (0.28)	-0.06 (<0.01)

The table presents proportion or mean (SE). Sample sizes correspond to numbers of practices.

[a] Approximate sample sizes based on the propensity for volunteering. Nationwide projected scaled sample characteristics are weighted averages of national practice characteristics, weighted by the propensity for volunteering. Characteristics for eligible practices not in the nationwide projected scaled sample are weighted by one minus the propensity for volunteering.

[b] We defined primary care practitioners using practitioner specialty information from NPPES and SK&A data. For practitioners with a valid NPI, we identified a practitioner as primary care using primary and secondary taxonomy codes in the NPPES (following the approach used in CPC+ payment methodology); for practitioners without an NPI in the SK&A data, we identified a practitioner as primary care using practitioner specialty information from SK&A (practitioner specialty was either family practice, general practice, geriatrician, internist, or internist and pediatrics).

[c] Percentage of practices that hold NCQA, TJC, AAAHC, URAC, or state medical-home recognition, or have participated in CPC Classic, CMMI's Transforming Clinical Practice Initiative, or CMMI's Multi-Payer Advanced Primary Care Program as of 2014.

[d] At least one practitioner attested to meaningful use under the Medicare EHR Incentive Program from 2011 to 2015.

[c] The (baseline) 2016 HCC score is based on beneficiaries' diagnoses in 2015.

[f] Calculated as the percentage of beneficiaries assigned to a practice in the baseline year who were dually eligible for Medicare and Medicaid in the quarter before the start of the baseline year.

[g] U.S. census region.

[h] We defined waves of the pandemic as follows for 2020: wave 1: March–May, wave 2: June–September, wave 3: October–December. See Appendix 5.G for definitions of excess deaths, the pandemic vulnerability index, and the social vulnerability index.

Table 5.J.3 *(continued)*

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = Accountable Care Organization; CMMI = Center for Medicare & Medicaid Innovation; CPC+ = Comprehensive Primary Care Plus; ED = emergency department; EHR = electronic health record; FFS = fee-for-service; HCC = hierarchical condition category; HRR = hospital referral region; NCQA = National Committee for Quality Assurance; NPI = National Provider Identifier; NPPES = National Plan and Provider Enumeration System; SE = standard error; SSP = Medicare Shared Savings Program.

Steps 2 and 3. Impact estimates for Track 1 of CPC+ in the evaluation sample and under two scale-up scenarios

In this section, we present results for (1) Medicare expenditures excluding enhanced CPC+ payments, (2) outpatient ED visits including observation stays, and (3) acute hospitalizations. For each of these three outcomes, we compare impact estimates between the evaluation sample and the overall (nationwide) projected scaled sample, then identify subsets of practices to target that are most likely to generate savings from Track 1 of CPC+.

A. Medicare expenditures excluding enhanced CPC+ payments

Key takeaways

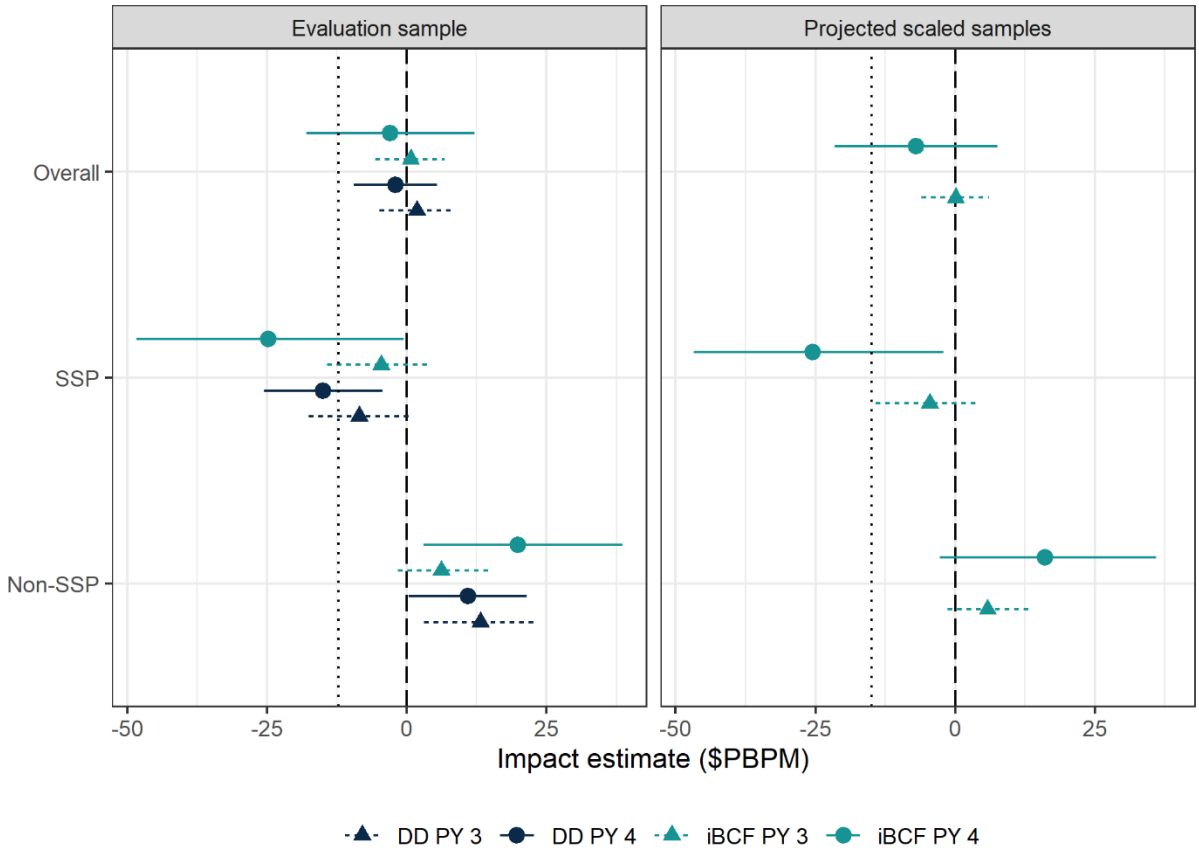
Although there is almost no chance a nationwide scale-up of Track 1 would be cost-neutral, a scale-up targeted to SSP practices (based on the definition of SSP as of January 1, 2017) would likely generate sufficient savings to offset CMFs. Furthermore, we estimate both nationwide and targeted Track 1 scale-ups could reduce ED visits and have a high probability of decreasing hospitalizations.

Scaling up the model nationally is unlikely to result in savings. Impact estimates for Track 1 of the evaluation sample based on iBCF largely align with those from the main DD analysis presented in Chapter 5, though with larger uncertainty intervals: in PYs 3 and 4, evaluation sample impacts were not statistically distinguishable from zero using either approach (Figure 5.J.2). As expected based on the similarity of effect modifiers between the nationwide projected scaled sample and evaluation sample (Table 3), iBCF-based estimates of CPC+ effects on Medicare expenditures without enhanced payments were likewise similar for the nationwide projected scaled sample and evaluation sample: -$7 PBPM (90 percent credible interval [CI] -$22 to $8) versus -$3 (-$18 to $12; Figure 5.J.2, Table 5.J.4).

Targeting the scale-up to SSP practices could generate savings. Although a nationwide scale-up of Track 1 is unlikely to generate savings, practice impact estimates were more heterogeneous in PY 4 (standard deviation [SD] across practices of $27 PBPM) than in PY 3 (SD of $6 PBPM). SSP participation primarily drove this heterogeneity. Both iBCF and DD evaluation sample analyses estimated a decrease in spending for SSP practices and an increase in spending for non-SSP practices in PY 4 (Figure 2). *Importantly, such differences in impacts across types of practices provide CMS the opportunity to target practice subsets that are most likely to generate savings.* Namely, we estimate that a scale-up targeted to SSP practices (based on the definition of SSP as of January 1, 2017) would have a 79 percent probability of offsetting CMFs, in contrast to an 18 percent probability with an overall nationwide expansion (Table 5.J.4). We predicted 54 percent of practices volunteering for a scale-up of Track 1 would be SSP participants. Such a targeted scale-up would reduce Medicare expenditures excluding enhanced CPC+ payments by an estimated $25 PBPM (90 percent CI -$47 to -$2), generating aggregate savings of about $228 million per year.

SSP participation likewise emerged as the strongest effect modifier in PY 3. However, the estimated impact of CPC+ among SSP practices was not large enough in PY 3 to offset CMFs. (Based on PY 3 impacts, iBCF estimated a reduction of $5 PBPM [-$14 to $4] for a scale-up targeted to SSP practices and a 4 percent probability of offsetting CMFs.) Thus, based on PY 3 impacts, further subsetting to a smaller set of practices would be necessary to identify a targeted scale-up group expected to be cost neutral.

Figure 5.J.2. Estimated impacts of Track 1 of CPC+ on Medicare expenditures, excluding enhanced CPC+ payments in the evaluation sample and projected scaled samples in PY 3 and PY 4 (estimate and 90% CI)



Note: Each point represents the estimated impact on Medicare expenditures and each horizontal line represents the corresponding 90 percent uncertainty interval (confidence interval for DD and credible interval for iBCF estimates). The dashed vertical line marks a $0 PBPM impact and the dotted vertical line corresponds to an impact equal in size to the average CMF across program years in the evaluation sample ($12 PBPM) and the average projected CMF nationwide ($15 PBPM), respectively. DD estimates are from the main impact analysis presented in Chapter 5. iBCF impact estimates are from the current analysis.

CI = confidence interval or credible interval; CMF = care management fee; DD = difference-in-differences; iBCF = individualized weighted Bayesian Causal Forest; PBPM = per beneficiary per month; PY = program year; SSP = Medicare Shared Savings Program.

iBCF estimates had wider uncertainty intervals in PY 4 than in PY 3, due to the challenges of precisely estimating impacts in the presence of COVID-19. Compared to PY 3 impact estimates, iBCF estimated greater uncertainty around all PY 4 impact estimates; the DD

estimates did not observe such an increase in uncertainty (Figure 5.J.2). See Sensitivity Analysis B for further explanations around this finding.

Table 5.J.4. Estimated impacts of Track 1 of CPC+ and probabilities of reducing Medicare expenditures in the evaluation sample and projected scaled samples in PY 4

	Subgroup	Estimated number of participating practices[a]	Estimated number of attributed Medicare FFS beneficiaries[b]	Proportion of eligible practices nationwide (%)	Proportion of attributed Medicare FFS beneficiaries in eligible practices nationwide (%)	Estimated impact on Medicare expenditures excluding enhanced CPC+ payments (90% CI) $PBPM	Estimated probability of reducing Medicare expenditures excluding enhanced CPC+ payments (%)	Probability of sufficient reduction to offset CMFs (%)	Aggregate annual impact estimates for Medicare expenditures including CMFs (90% CI) million $[c]
PY 4, Evaluation sample									
Method: iBCF	Overall	1,373	877,150	3	4	-3 (-18, 12)	63	15	97 (-189, 128)
	SSP	738	451,485	2	2	-25 (-48, -1)	95	80	-68 (-262, -3)
	Non-SSP	635	425,665	1	2	20 (3, 39)	3	<1	164 (15, 197)
Method: DD	Overall	Same as iBCF evaluation sample	Same as iBCF evaluation sample	Same as iBCF evaluation sample	Same as iBCF evaluation sample	-2 (-9, 5)	NA	NA	113 (35, 191)
	SSP					-15 (-26, -4)	NA	NA	-12 (-70, 45)
	Non-SSP					11 (0, 22)	NA	NA	121 (67, 175)
PY 4, Projected scaled samples									
Method: iBCF	Overall	4,927	3,270,535	10	16	-7 (-22, 8)	78	18	315 (-832, 301)
	SSP	2,670	1,816,246	5	9	-25 (-47, -2)	96	79	-228 (-1003, -46)
	Non-SSP	2,257	1,454,289	5	7	16 (-3, 36)	8	<1	543 (-48, 629)
PY 3, Evaluation sample									
Method: iBCF	Overall	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	1 (-6, 7)	42	<1	141 (-59, 72)
	SSP					-5 (-14, 4)	79	8	44 (-77, 21)
	Non-SSP					6 (-2, 15)	11	<1	96 (-8, 75)
Method: DD	Overall	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	2 (-5, 9)	NA	NA	153 (82, 224)

Table 5.J.4 *(continued)*

	Subgroup	Estimated number of participating practices[a]	Estimated number of attributed Medicare FFS beneficiaries[b]	Proportion of eligible practices nationwide (%)	Proportion of attributed Medicare FFS beneficiaries in eligible practices nationwide (%)	Estimated impact on Medicare expenditures excluding enhanced CPC+ payments (90% CI) $PBPM	Estimated probability of reducing Medicare expenditures excluding enhanced CPC+ payments (%)	Probability of sufficient reduction to offset CMFs (%)	Aggregate annual impact estimates for Medicare expenditures including CMFs (90% CI) million $[c]
	SSP					-8 (-18, 1)	NA	NA	23 (-26, 72)
	Non-SSP					13 (3, 23)	NA	NA	132 (81, 184)
PY 3, Projected scaled samples									
Method: iBCF	Overall	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	Same as iBCF evaluation sample and projected scaled samples, respectively	0 (-6, 6)	47	<1	592 (-242, 235)
	SSP					-5 (-14, 4)	78	4	229 (-309, 83)
	Non-SSP					6 (-1, 14)	10	<1	363 (-24, 238)

[a] For the evaluation sample: the number of CPC+ practices that began their CPC+ participation in 2017 for the subgroup. For the projected scaled samples: the sum across practices' propensities for volunteering, for the subgroup.

[b] For the evaluation sample: the number of beneficiaries attributed to a practice in the baseline year, summed over the subgroup. For the projected scaled sample: the number of beneficiaries attributed to a practice in the baseline year multiplied by the propensity for volunteering for that practice, summed over the subgroup.

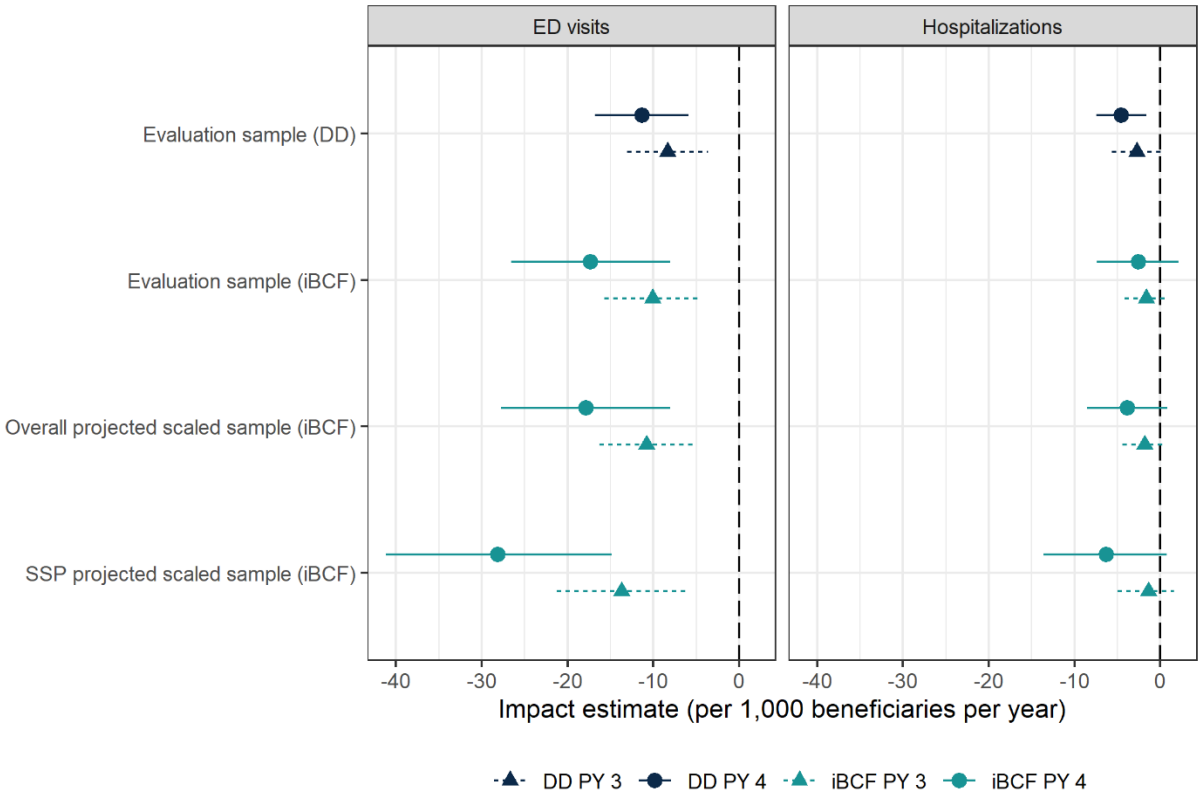
[c] Calculated as the estimated PBPM impact on Medicare expenditures including CMFs multiplied by the estimated number of Medicare FFS beneficiaries attributed to a practice in the baseline year and by 12 months. Note that, because beneficiary attribution and eligibility were not available for the projected scaled sample in PYs 3 and 4, to calculate aggregate annual impact estimates, we instead assumed all beneficiaries attributed at baseline would be eligible for the full 12 months of each PY. For consistency with the projected scaled sample methodology, we likewise used this approach for the evaluation sample rather than using eligible beneficiary months.

CI = credible interval; CMF = care management fee; CPC+ = Comprehensive Primary Care Plus; DD = difference-in-differences; FFS = fee-for-service; iBCF = individualized weighted Bayesian Causal Forest; NA = not applicable; PBPM = per beneficiary per month; PY = program year; SSP = Medicare Shared Savings Program.

B. Outpatient ED visits, including observation stays

We estimated both overall and SSP projected scaled samples to reduce outpatient ED visits with more than a 99 percent probability for Track 1 of CPC+ (Figure 5.J.3, Table 5.J.5). iBCF-based estimates for the overall projected scaled sample were again similar to evaluation sample estimates: a reduction of 18 per 1,000 beneficiaries per year (90 percent CI -28 to -8) in the projected scaled sample and a reduction of 17 per 1,000 beneficiaries per year (90 percent CI -27 to -8) in the evaluation sample (Table 5.J.5). For the evaluation sample, both iBCF and DD estimated reductions in ED visits in PYs 3 and 4 (Figure 5.J.3).

Figure 5.J.3. Estimated impacts of Track 1 of CPC+ on outpatient ED visits including observation stays and on acute hospitalizations in the evaluation sample and projected scaled samples in PY 3 and PY 4 (estimate and 90% CI)



Note: Each dot represents the estimated impact on annualized outpatient ED visits including observation stays or acute hospitalizations, per 1,000 beneficiaries. Each horizontal line represents the corresponding 90 percent uncertainty interval (confidence interval for DD and credible interval for iBCF estimates). The dashed vertical line marks an impact estimate of zero. DD estimates are from the main impact analysis presented in Chapter 5 of the fourth annual report. iBCF impact estimates are from the current analysis.

CI = confidence interval or credible interval; DD = difference-in-differences; ED = emergency department; iBCF = individualized weighted Bayesian Causal Forest; PY = program year; SSP = Medicare Shared Savings Program.

Similar to what we observed for Medicare expenditures, impact estimates for ED visits become more pronounced in PY 4 compared to PY 3: overall estimated effects became more favorable and the strength of effect modification increased, the latter reflected in more heterogeneous practice-specific impact estimates (SD across practices of 21 versus 4 per 1,000 beneficiaries per

year). SSP status again drove these differences among practices most strongly. Differences in impact estimates between SSP and non-SSP practices thus became more distinct in PY 4 compared to PY 3 (Figure 5.J.3). In PY 4, we estimate a cost-neutral scale-up of Track 1 targeted to SSP practices will reduce annual ED visits by 28 per 1,000 beneficiaries (90 percent CI -41 to -15) and to have more than a 99 percent probability of lowering ED visits.

Table 5.J.5. Estimated impacts of Track 1 of CPC+ and probabilities of reducing outpatient ED visits including observation stays in the evaluation sample and projected scaled samples in PY 4

	Subgroup	Estimated impact per 1,000 beneficiaries per year (90% CI)	Estimated probability of reducing ED visits (%)	Aggregate annual impact estimates (thousands)[a]
PY 4, Evaluation sample				
Method: iBCF	Overall	-17 (-27, -8)	>99	-15 (-23, 4)
	SSP	-29 (-42, -16)	>99	-13 (-19, -2)
	Non-SSP	-5 (-18, 9)	73	-2 (-8, 9)
Method: DD	Overall	-11 (-17, -6)	NA	-10 (-15, -5)
	SSP	-14, (-22, -7)	NA	-6 (-10, -3)
	Non-SSP	-7 (-15, 2)	NA	-3 (-6, 1)
PY 4, Projected scaled samples				
Method: iBCF	Overall	-18 (-28, -8)	>99	-58 (-91, 23)
	SSP	-28 (-41, -15)	>99	-51 (-76, 0)
	Non-SSP	-5 (-19, 9)	73	-7 (-28, 36)
PY 3, Evaluation sample				
Method: iBCF	Overall	-10 (-16, -4)	>99	-9 (-14, 7)
	SSP	-13 (-21, -5)	99	-6 (-10, 3)
	Non-SSP	-7 (-15, 1)	92	-3 (-6, 6)
Method: DD	Overall	-8 (-13, -4)	NA	-7 (-11, -3)
	SSP	-8 (-14, -1)	NA	-3 (-6, -1)
	Non-SSP	-9 (-16, -2)	NA	-4 (-7, -1)
PY 3, Projected scaled samples				
Method: iBCF	Overall	-11 (-16, -5)	>99	-35 (-54, 32)
	SSP	-14 (-21, -6)	>99	-25 (-39, 17)
	Non-SSP	-7 (-15, 0)	95	-10 (-21, 22)

[a] Calculated as the estimated impact per year multiplied by the estimated number of assigned Medicare FFS beneficiaries. Note that, because beneficiary attribution and eligibility were not available for the projected scaled samples in PYs 3 and 4, to calculate aggregate annual impact estimates, we instead assumed all beneficiaries attributed at baseline would be eligible for the full 12 months of each PY. For consistency with the projected scaled sample methodology, we likewise used this approach for the evaluation sample rather than using eligible beneficiary months.

CI = confidence interval or credible interval; DD = difference-in-differences; ED = emergency department; FFS = fee-for-service; iBCF = individualized weighted Bayesian Causal Forest; NA = not applicable; PY = program year; SSP = Medicare Shared Savings Program.

C. Acute hospitalizations

We estimate both an overall nationwide and a targeted scale-up approach of Track 1 would reduce hospitalizations in PY 4, though with an estimated 91 percent probability for a nationwide scale-up and a 93 percent probability for a targeted scale-up to SSP practices (Figure 5.J.3, Table 5.J.6). Although impact estimates increased in magnitude in PY 4 compared to PY 3, uncertainty in the estimated average impacts correspondingly increased (so a nationwide scale-up had an estimated 91 percent probability of reducing hospitalizations both in PY 4 and PY 3).

iBCF-based estimates of CPC+ Track 1 effects on annual hospitalizations per 1,000 beneficiaries were similar for the nationwide projected scaled sample (a reduction of 4 with 90 percent CI -9 to 1) and the evaluation sample (a reduction of 3 with 90 percent CI -7 to 2; Figure 5.J.3, Table 5.J.6).

In the evaluation sample, the estimated reduction in hospitalizations in PY 4 from the DD analysis was statistically significant for all Track 1 practices. The iBCF PY 4 findings of an estimated 81 percent probability of reducing hospitalizations for Track 1 evaluation sample practices mirrored these DD results; the probability accounted for larger uncertainty bounds around iBCF PY 4 estimates. Sensitivity Analysis B discusses these large credible intervals.

As we observed for the other outcomes, practice-specific impact estimates showed more heterogeneity (and larger uncertainty) in PY 4 than in PY 3 (an SD across practices of 6 versus 1 per 1,000 beneficiaries per year, respectively). Differences in effects were driven by mean beneficiary age followed by SSP participation (SSP practices with an average age of at least 71 were more likely to reduce hospitalizations).

Similar to other outcomes, targeting SSP practices resulted in slightly more favorable impact estimates than a nationwide scale-up: we estimated a reduction of six annual hospitalizations per 1,000 beneficiaries (-14 to 1) for the SSP projected scaled sample. A nationwide scale-up resulted in a 91 percent probability of reducing hospitalization rates, whereas a scale-up targeted to SSP practices would have a 93 percent probability of reductions (and a scale-up to non-SSP nationwide practices would have a 58 percent probability of reductions; Table 5.J.6). Impact estimates for a scale-up targeted to SSP practices increased in magnitude in PY 4 compared to PY 3; an SSP-targeted scale-up based on PY 3 findings would have a 74 percent probability of reducing hospitalizations.

Table 5.J.6. Estimated impacts of Track 1 of CPC+ and probabilities of reducing acute hospitalizations in the evaluation sample and projected scaled samples in PY 4

	Subgroup	Estimated impact per 1,000 beneficiaries per year (90% CI)	Estimated prob. of reducing acute hospitalizations (%)	Aggregate annual estimated impact (thousands)[a]
PY 4, Evaluation sample				
Method: iBCF	Overall	-3 (-7, 2)	81	-2 (-7, 13)
	SSP	-5 (-13, 3)	86	-2 (-6, 7)
	Non-SSP	0 (-6, 6)	51	0 (-2, 8)
Method: DD	Overall	-5 (-7, -2)	NA	-4 (-7, -1)
	SSP	-8 (-12, -4)	NA	-4 (-5, -2)
	Non-SSP	-1 (-5, 3)	NA	0 (-2, 1)
PY 4, Projected scaled samples				
Method: iBCF	Overall	-4 (-9, -1)	91	-12 (-28, 53)
	SSP	-6 (-14, 1)	93	-11 (-25, 29)
	Non-SSP	-1 (-6, 5)	58	-1 (-9, 29)
PY 3, Evaluation sample				
Method: iBCF	Overall	-2 (-4, 1)	87	-1 (-4, 12)
	SSP	-1 (-5, 2)	76	-1 (-2, 6)
	Non-SSP	-2 (-5, 2)	81	-1 (-2, 6)
Method: DD	Overall	-3 (-6, 0)	NA	-2 (-5, 0)
	SSP	-5 (-9, -1)	NA	-2 (-4, -1)

Table 5.J.6 *(continued)*

	Subgroup	Estimated impact per 1,000 beneficiaries per year (90% CI)	Estimated prob. of reducing acute hospitalizations (%)	Aggregate annual estimated impact (thousands)[a]
	Non-SSP	0 (-5, 4)	NA	0 (-2, 2)
PY 3, Projected scaled samples				
Method: iBCF	Overall	-2 (-4, 0)	91	-6 (-15, 51)
	SSP	-1 (-5, 2)	74	-2 (-9, 30)
	Non-SSP	-2 (-6, 1)	88	-4 (-9, 23)

[a] Calculated as the estimated impact per year multiplied by the estimated number of assigned Medicare FFS beneficiaries. Note that, because beneficiary attribution and eligibility were not available for the projected scaled samples in PYs 3 and 4, to calculate aggregate annual impact estimates, we instead assumed all beneficiaries attributed at baseline would be eligible for the full 12 months of each PY. For consistency with the projected scaled sample methodology, we likewise used this approach for the evaluation sample rather than using eligible beneficiary months.

CI = confidence interval or credible interval; DD = difference-in-differences; FFS = fee-for-service; iBCF = individualized weighted Bayesian Causal Forest; NA = not applicable; PY = program year; SSP = Medicare Shared Savings Program.

Step 4. Assess sensitivity to assumptions

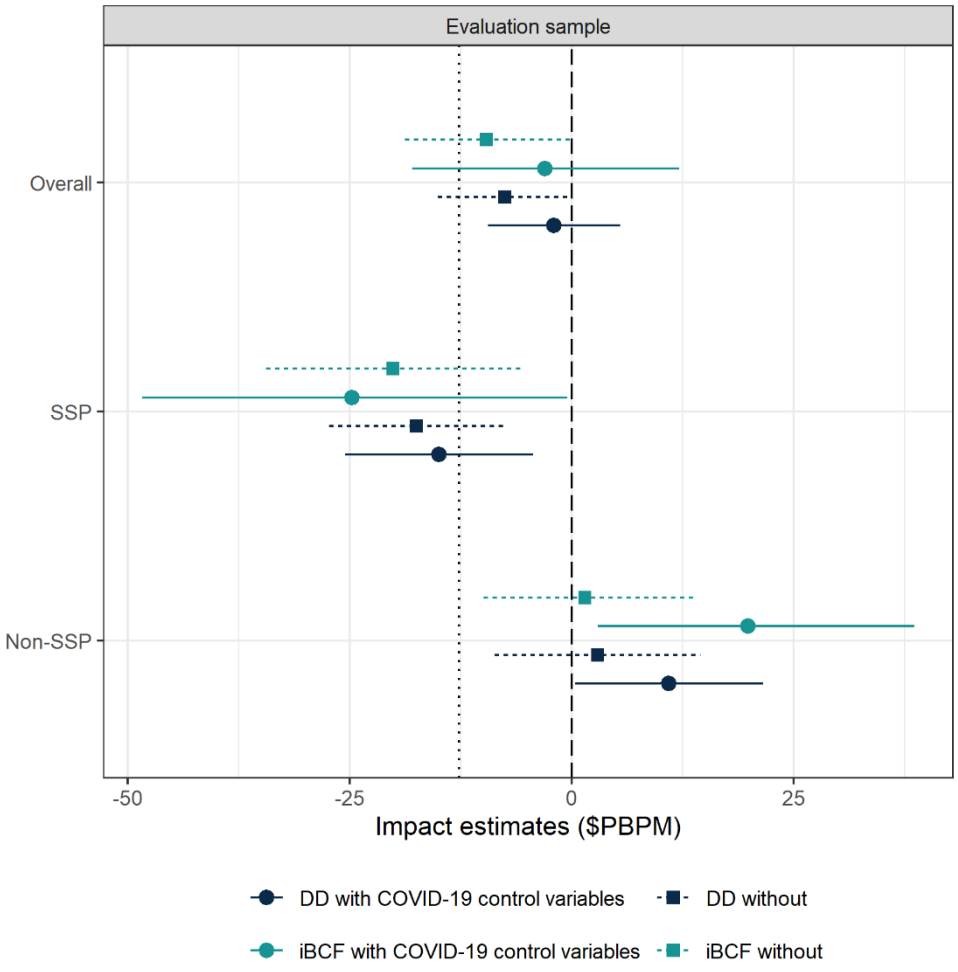
A. Sensitivity Analysis A: Unmeasured effect modifiers

Even if the projected scaled samples differed substantially from the evaluation sample on a strong unmeasured subgroup variable, such as practices' motivation to improve, the targeting strategies proposed before would likely still achieve savings. Specifically, we considered unmeasured effect modification as strong as (1) the strongest measured effect modifier bias, a worst-case scenario; and (2) the second-strongest effect modifier bias, a next-to-worst-case scenario. For expenditures excluding enhanced CPC+ payments, such an unmeasured effect modifier, both in the worst and next-to-worst case, would *attenuate projected scaled sample impacts by about $2 PBPM for Track 1.* Despite such an attenuation, savings would remain large enough to offset CMFs for the scale-up targeted to SSP practices.

B. Sensitivity Analysis B: Confounding by COVID-19

In the main scalability analysis, iBCF estimated greater uncertainty around all PY 4 impact estimates compared to PY 3 impact estimates; we did not observe such an increase in uncertainty in the DD estimates (Figure 5.J.2). Standard errors for PY 4 evaluation-sample impact estimates for Medicare expenditures were therefore twice as large for iBCF ($9.1 PBPM) than for DD ($4.5 PBPM). To assess whether these wide credible intervals resulted from iBCF's flexible modeling of COVID-19 control variables, we removed COVID-19 control variables from the regression. When not controlling for confounding or effect modification by COVID-19, the estimated uncertainty around PY 4 impact estimates aligned more closely for the two methods (standard errors of $5.7 for iBCF and $4.6 PBPM for DD; Figure 5.J.4), suggesting iBCF's adjustment for confounding and effect modification by COVID-19 was indeed responsible for the large credible intervals.

Figure 5.J.4. Estimated impacts of Track 1 of CPC+ on Medicare expenditures excluding enhanced CPC+ payments in the evaluation sample when adjusting and not adjusting for COVID-19 control variables in PY 4 (estimate and 90% CI)



Note: Each point represents the estimated impact on Medicare expenditures without enhanced payments and each horizontal line represents the corresponding 90 percent uncertainty interval (confidence interval for DD and credible interval for iBCF estimates). The dashed vertical line marks a $0 PBPM impact and the dotted vertical line corresponds to an impact equal in size to the average CMF across program years in the evaluation sample ($12.69 PBPM). DD estimates are from the impact analysis presented in Chapter 5 of the fourth annual report, with and without adjusting for COVID-19 control variables. iBCF impact estimates are from the current analysis, with and without adjusting for COVID-19 control variables.

CI = confidence interval or credible interval; CMF = care management fee; DD = difference-in-differences; iBCF = individualized weighted Bayesian Causal Forest; PBPM = per beneficiary per month; PY = program year; SSP = Medicare Shared Savings Program.

5.J.4. Discussion

The impact of a CPC+ scale-up will differ from the impact calculated using the evaluation sample only to the extent practices participating in the scale-up differ from those in the evaluation sample on characteristics that modify the effect of CPC+ (that is, on important subgroup variables). In this scalability analysis, we estimated eligible U.S. practices that we predict would volunteer for a nationwide scale-up do not meaningfully differ on effect modifiers

from the practices in the evaluation sample. It follows directly that our estimates of the impact of a ***nationwide scale-up*** of Track 1 are similar to the primary impact estimates presented in Chapter 5.

However, we project more favorable impacts of a ***targeted scale-up*** to SSP practices, where the intervention would have a 79 percent probability of being cost neutral. This data-driven approach to targeting the CPC+ scale-up offers large improvements in impacts over those in the evaluation sample. Although CMS chose CPC+ regions for high payer alignment, practices within those regions largely do not have characteristics we find are associated with large CPC+ effects.

iBCF targeted scale-up recommendations based on PY 4 impact estimates are consistent with trends that began to emerge in PY 3, with PY 4 estimates from the main DD impact analysis, and with the logic model proposed during the evaluation study design. The main DD impact analysis showed reductions in hospitalizations and a corresponding decline in inpatient expenditures drove the reductions in total Medicare expenditures in PY 4 among Track 1 SSP practices. It is possible that because of SSP ACOs' ability to share the savings generated through reduced Medicare expenditures, SSP participation aligns incentives for providers in the same ACO, such as primary care providers, specialists, and hospitals, thus leading to meaningful reductions in service use, including acute care use. Although no qualitative evidence from the deep-dive interviews or practice surveys point to SSP practices implementing CPC+ differently from non-SSP practices, without those shared savings, specialists and hospitalists that are not in an SSP might have insufficient incentives to change behaviors to reduce service use. Primary care changes take time to translate to meaningful impacts, and the favorable estimates emerging for Track 1 SSP practices in PYs 3 and 4 are in line with the expectation that CPC+ could reduce hospitalizations in later years of the intervention. However, in preliminary analyses of Track 2, iBCF did not find differential impacts by SSP status. While Track 2 had more complex care delivery requirements and larger payments, which may encourage larger impacts for SSP practices and overall, CMS also required Track 2 practices to have more advanced care delivery at enrollment, which might have limited the room they had left for improvement, potentially precluding sufficient savings to offset the higher CMFs.

To estimate the impacts of scaling up CPC+, the scalability analysis addressed differences in characteristics between the evaluation sample and the projected scaled samples and captured uncertainty around which practices would volunteer for the scale-up. However, just as evaluation findings rely on assumptions necessary for estimating effects in the evaluation sample, these scalability conclusions rely on a further set of assumptions necessary for estimating effects in the projected scaled samples. We tested one such assumption, no unmeasured effect modifiers, and found if an unmeasured effect modifier was as powerful for predicting impacts as the strongest measured effect modifier (SSP status), a scale-up of Track 1 to SSP practices would nonetheless remain cost neutral.

Scale-up assumptions we did not examine in sensitivity analyses include no relevant temporal differences between the scale-up and the evaluation, no differences in practice characteristics from what we saw in 2017—particularly as they relate to practice targeting, no region-specific shocks, no differences in drivers of participation, no spillover effects, not retaining benefits after model termination, and no uncaptured changes due to COVID-19. As is always the case when impact analyses rely on assumptions, our results depend on them being true. Specifically, neither

our scalability point estimates nor their credible intervals reflect any uncertainty around these assumptions; the assumptions present an additional source of uncertainty that our results do not capture. We now discuss these assumptions and their implications in turn.

Temporal changes between the evaluation and scale-up. The scalability analyses presented here account for differences between the evaluation sample and scaled-up samples; they do not account for (1) potential changes under scale-up to model implementation nor (2) for changes since 2017 in the healthcare context.

Changes to health information technology (IT), care delivery, payment, lessons learned from the evaluation's implementation, differences in payer partnership, alignment and supports, and changes to learning support in the scale-up could potentially increase or decrease impacts for new participants compared to what we observed in evaluation sample practices with similar characteristics. For example, impacts might be larger due to changes in health IT: CPC+ participants constituted a small portion of health IT vendors' client base; these vendors therefore did not make many changes specific to CPC+. With a larger market share, CPC+ participants might drive health IT vendors to improve functionalities that require more tailoring to CPC+ requirements, such as reporting and care management, although these vendors' customer support resources could also be more strained. In addition, vendors already adopted changes they view to be best practices. New practices' impacts might therefore potentially be slightly larger under a scale-up compared to those seen for similar practices in the existing model. Furthermore, lessons learned from the existing implementation might drive faster improvements. In interviews, practices that joined in 2018 noted they benefited from the experience of the prior cohort. However, the evaluation's 14 CPC+ geographic regions, which see greater payer alignment, might also see larger impacts due to this alignment (although the bulk of CPC+ financing and changes came from CMS rather than from private payers: 96 percent of unique funding for CPC+ practices in PY 4). The CPC+ model also revised its learning support over time, with less emphasis on resource-intensive interventions such as one-on-one coaching, and more emphasis on scalable interventions such as peer learning and webinars. Such changes might lead to more delayed effects in the scale-up, particularly for practices that have less experience with prior primary care transformation. Cumulatively, these potential differences between the evaluation's CPC+ implementation and what we would expect in a scale-up lead to some uncertainty as to whether effects for new participants would be larger or smaller than for existing practices with similar characteristics.

Relatedly, practices would certainly implement a CPC+ scale-up in a different context from that in the original model. Since 2017, the health care environment has evolved and will unquestionably continue to do so, such as in the availability of competing care delivery models and programs. These alternative programs could very well moderate CPC+ impacts, as could changing state policies and other features of the context in which practices implemented CPC+ that might differ beyond 2022. The effects of these differences on model impacts could quite plausibly be large, but neither our point estimates nor their uncertainty intervals capture these factors. Cumulatively, future changes to the model and context substantially undermine our confidence in the predictive accuracy of our estimates. Instead, one should more precisely think of our estimates as providing an accurate retrospective estimate of what the impact would have been had CMS offered CPC+ nationwide in 2017. In this sense, although our analysis sought to

be rigorous in its approach to extrapolating geographically, it does not tackle the harder challenge of extrapolating impacts forward in time.

Practice characteristics and targeting. Our work assumes practice characteristics have largely remained unchanged since we collected baseline data on them in 2016 and 2017. We have accounted for the increase in EHR usage by assuming all practices would meet the Certified Electronic Health Record Technology eligibility criterion at the time of scale-up. However, if practice characteristics today differ from characteristics in 2017 across effect modifiers such as SSP status, effect estimates at the time of scale-up will likewise differ. Specifically, a practical challenge of implementing our recommended targeted scale-up to SSP practices is that the SSP program has changed since 2017. With more downside risks, the types of practices that participated in SSP as of January 1, 2017, and the types of practices participating today might have likewise changed. For example, from 2017 to 2021, among CPC+ practices, almost one-third of SSP practices dropped out of SSP and more than one-quarter of non-SSP practices joined the program. Thus, although we based our recommendation on our highly favorable estimate of impacts among 2017 SSP practices, 2022 SSP practices would not necessarily achieve the same impacts. For 2017 SSP practice impacts to correspond to 2022 SSP practice impacts, we have to assume the evaluation-sample impacts relate to 2017 characteristics in the same way that scale-up impacts will relate to 2022 characteristics. Our analysis did not capture uncertainty around this assumption.

Region-specific shocks. We assume no region-specific shocks (changes in outcomes) differentially affected CPC+ and comparison practices (which we drew from external regions). For example, consider our key finding that favorable impacts concentrate in SSP practices. Because SSP practices were more likely to be in the Northeast, if the true cause of improving outcomes in SSP practices was not CPC+ but rather a Northeast region-specific shock (such as a change in state policies, an extreme weather event, or localized differences in COVID-19 outbreak and response), it would invalidate our estimates of the impact of a CPC+ scale-up. However, SSP practices were likewise found nationally, so unmeasured variation in regional factors were unlikely to heavily drive scalability findings. Furthermore, our sensitivity analysis reassured us we would not be sensitive to unmeasured effect modification from region-specific shocks, unless they were more extreme than what we observed for measured effect modifiers.

Drivers of participation. Because CMS chose CPC+ regions for having increased payer alignment, new regions might see different drivers of participation. For example, lower payer alignment in scale-up regions could lead to lower participation rates. The changing policy landscape, the COVID-19 pandemic, and any alternative models available such as Primary Care First and Direct Contracting, might also differentially drive participation. Although lower or higher overall participation would not affect PBPM impacts, different drivers of participation would lead to uncertainty in scale-up effects that our analyses do not capture.

Spillover effects. The model could affect nonparticipants in regions with CPC+ practices due to spillover effects. For example, large health systems make changes for CPC+ that benefit all practices, including those that are not in CPC+. These spillover effects could increase impacts (from nonvolunteering practices that benefit) or decrease impacts (from non-CPC+ practices in CPC+ regions that have already benefited from the evaluation's model).

Retention of changes after model termination. Because some of the CPC+ changes required fixed rather than variable costs, evaluation sample participants might retain some of the changes brought about by the model when CMS discontinued it. In this case, our estimates would overstate true scale-up impacts, because practices would retain the benefits of fixed-cost changes after the evaluation period ended even without a scale-up. These fixed-cost changes include changes to discharge protocols (such as coordination and communication with specialists), collecting data more systematically for electronic clinical quality measures, and process of care and workflow improvements (such as improved appointment scheduling processes and same-day appointment availability). However, the CPC+ components theorized to drive the most changes require continued investments: hiring new staff for enhanced care management (e.g., nurse care managers); behavioral health integration (e.g., embedding behavioral health staff); and episodic care management (e.g., following up with patients after visits to avoid readmissions and exacerbation). Practices are uncertain whether they will be able to retain changes that require continued investment after CMS terminates the model.

COVID-19. This analysis adjusted for confounding and effect modification of COVID-19, but measured factors imperfectly capture the upheaval caused by the pandemic. The pandemic affects service use, care delivery, drivers of participation, and patient and practice characteristics we cannot fully account for with our data. For example, the pandemic might increase (or decrease) ED visits, hospitalizations, and spending in a localized manner due to outbreaks beyond what excess mortality, the pandemic vulnerability index, government response index, and social vulnerability index can control for. Triple-differences results presented in Appendix 5.F reinforce the internal validity of evaluation impact findings, and by extension scalability results. As concerning external validity, if impact heterogeneity due to COVID-19 were as strong as the strongest measured effect modifier, then, as seen in the sensitivity analysis, a cost-neutral targeted scale-up would remain feasible.

The impacts of a primary care intervention on Medicare expenditures take time to manifest, and with more pronounced PY 4 impacts than PY 3 impacts, we estimate targeting a scale-up of Track 1 of CPC+ to practices participating in SSP (half of all practices estimated to volunteer nationwide) would likely decrease hospitalizations and ED visits while offsetting CMFs. Although CMS might not scale CPC+, future models such as Primary Care First could consider similar analyses to guide an evidence-based targeted scale-up. Future work can also consider scaling to practice types and geographic regions estimated to improve quality of care, because the Innovation Center model expansion criteria are for Medicare savings with no change in quality or Medicare cost neutrality with quality improvements. The work in this Appendix describes some potential paths forward and can inform future directions for the Innovation Center's primary care model.

This page has been left blank for double-sided copying.

REFERENCES

Alexander, G.C., K.B. Stoller, J.D. Haffajee, and B. Saloner. "An Epidemic in the Midst of a Pandemic: Opioid Use Disorder and COVID-19." *Annals of Internal Medicine*, April 2020, pp. 57–58. doi: 10.7326/M20-1141

American Academy of Family Physicians (AAFP). "AAFP Chronic Pain Management Toolkit." Available at https://www.aafp.org/patient-care/public-health/pain-opioids/cpm-toolkit.html. Updated 2021. Accessed October 14, 2021.

American Medical Association (AMA). "Issue Brief: Nation's Drug-Related Overdose and Death Epidemic Continues to Worsen." 2021. Available at https://www.ama-assn.org/system/files/issue-brief-increases-in-opioid-related-overdose.pdf. Accessed September 27, 2021.

Amrhein, V., S. Greenland, and B. McShane. "Scientists Rise Up Against Statistical Significance." *Nature,* vol. 567, March 2019; pp. 305–307.

Anglin, G., D. Peikes, M. Harrington, A. Ghosh, K. Geonnotti, A. O'Malley, S. Dale, et al. "Evaluation of the Comprehensive Primary Care Plus Initiative: First Annual Report, Supplemental Volume." Princeton, NJ: Mathematica, 2019.

Anglin, G., D. Peikes, D. Petersen, A. O'Malley, K. Geonnotti, et al. "Evaluation of the Comprehensive Primary Care Plus Initiative: Second Annual Report, Supplemental Volume." Princeton, NJ: Mathematica, 2020.

Ash, A.S., S.E. Fienberg, T.A. Louis, S-L.T. Normand, T.A. Stukel, and J. Utts; Committee of Presidents of Statistical Societies. "Statistical Issues in Assessing Hospital Performance." Centers for Medicare & Medicaid Services, 2012, revised January 27, 2012. Accessed October 21, 2019. Available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Downloads/Statistical-Issues-in-Assessing-Hospital-Performance.pdf.

Attanasio, O., C. Meghir, and M. Szekely. "Using Randomised Experiments and Structural Models for `scaling up': Evidence from the PROGRESA Evaluation." IFS Working Paper EWP03/05, May 2003, p. 43.

Bailit, M.H., M.W. Friedberg, and M.L. Houy. "Standardizing the Measurement of Commercial Health Plan Primary Care Spending." New York: Milbank Memorial Fund, 2017.

Baker, J.M., R.W. Grant, and A. Gopalan. "A Systematic Review of Care Management Interventions Targeting Multimorbidity and High Care Utilization." *BMC Health Services Research,* vol. 18, no. 1, 2018, p. 65. doi:10.1186/s12913-018-2881-8

Barker, P.M., A. Reid, and M. W. Schall. "A Framework for Scaling Up Health Interventions: Lessons from Large-Scale Improvement Initiatives in Africa." *Implementation Science,* vol. 11, no. 12, 2016.

Bazemore, A., S. Petterson, L.E. Peterson, and R.L. Phillips, Jr. "More Comprehensive Care Among Family Physicians Is Associated with Lower Costs and Fewer Hospitalizations." *Annals of Family Medicine,* vol.13, no. 3, 2015, pp. 206–213.

Belgrave, L.L., and K.J. Smith. "Negotiated Validity in Collaborative Ethnography." *Qualitative Inquiry,* vol. 1, 1995, pp. 69–86.

Berenson, R.A., and E.C. Rich. "US Approaches to Physician Payment: The Deconstruction of Primary Care." *Journal of General Internal Medicine,* vol. 25, no. 6, 2010, pp. 613–618.

Bindman, A.B., K. Grumbach, D. Osmond, et al. "Preventable Hospitalizations and Access to Health Care." *JAMA,* vol. 274, 1995, pp. 305–311.

Bohl, A., and M. Roozeboom-Baker. "A COVID-19 Primer: Analyzing Health Care Claims, Administrative Data, and Public Use Files." Princeton, NJ: Mathematica, July 2020. Available at https://www.mathematica.org/our-publications-and-findings/publications/a-covid-19-primer-analyzing-health-care-claims-administrative-data-and-public-use-files.

Breslau, N., and K.G. Reeb. "Continuity of Care in a University-Based Practice." *Journal of Medical Education and Curricular Development,* vol. 50, no. 10, 1975, pp. 965–969.

Brown, R.S., D. Peikes, G. Peterson, J. Schore, and C.M. Razafindrakoto. "Six Features of Medicare Coordinated Care Demonstration Programs That Cut Hospital Admissions of High-Risk Patients." *Health Affairs (Millwood),* vol. 31, no. 6, 2012, pp. 1156–1166. doi:10.1377/hlthaff.2012.0393

Buchmueller, T.C., and C. Carey. "The Effect of Prescription Drug Monitoring Programs on Opioid Utilization in Medicare." *American Economic Journal: Economic Policy,* vol.10, no. 1, 2018, pp. 77–112.

Carpenter, B., A. Gelman, M.D. Hoffman, et al. "Stan: A Probabilistic Programming Language." *Journal of Statistical Software,* vol. 76, no. 1, 2017. doi: 10.18637/jss.v076.i01

Centers for Disease Control and Prevention (CDC). "U.S. Opioid Dispensing Rate Maps." 2019. Available at https://www.cdc.gov/drugoverdose/rxrate-maps/index.html. Accessed on September 27, 2021.

Centers for Disease Control and Prevention (CDC). "Prescribing Practices: Changes in Opioid Prescribing Practices." 2020. Available at https://www.cdc.gov/drugoverdose/deaths/prescription/practices.html. Accessed September 27, 2021.

Centers for Disease Control and Prevention (CDC). "Analyzing Opioid Prescription Data and Oral Morphine Milligram Equivalents (MME)." June 2021. Available at https://www.cdc.gov/opioids/data-resources/index.html. Accessed July 30, 2021.

Centers for Medicare & Medicaid Services (CMS). "Public Comment Summary Report. Potential Opioid Overuse." 2018. Available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Downloads/Electronic-Clinical-Quality-Measure-eCQM-Development-and-Maintenance-for-Eligible-Professionals-EP-eCQM-%E2%80%93-Potential-Opioid-Overuse-Summary-Report.pdf. Accessed October 14, 2021.

Centers for Medicare & Medicaid Services (CMS). "Behavioral Health Integration Services." May 2019. Available at https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/BehavioralHealthIntegration.pdf. Accessed October 30, 2019.

Centers for Medicare & Medicaid Services (CMS). "Comprehensive Primary Care Plus." Updated September 27, 2021a. Available at https://innovation.cms.gov/innovation-models/comprehensive-primary-care-plus. Accessed September 8, 2021.

Centers for Medicare & Medicaid Services (CMS). "Primary Care First." Available at https://innovation.cms.gov/innovation-models/primary-care-first-model-options. Accessed October 1, 2021b.

Chen, J.H., K. Humphreys, N.H. Shah, and A. Lembke. "Distribution of Opioids by Different Types of Medicare Prescribers." *JAMA Internal Medicine,* vol. 176, no. 2, 2016, pp. 259–261. doi:10.1001/jamainternmed.2015.6662

Ciccarone, D. "The Rise of Illicit Fentanyls, Stimulants and the Fourth Wave of the Opioid Overdose Crisis." *Current Opinion in Psychiatry,* vol. 34, no. 4, July 2021, pp. 344–350. https://doi.org/10.1097/YCO.0000000000000717

Cole, S., and E. Stuart. "Generalizing Evidence from Randomized Clinical Trials to Target Populations: The ACTG 320 Trial." *American Journal of Epidemiology,* vol. 172, no. 1, July 2010, pp. 107–115.

Coleman, E.A., C. Parry, and S. Chalmers. "The Care Transitions Intervention: Results of a Randomized Controlled Trial." *Archives of Internal Medicine,* vol. 166, no. 17, 2006, pp. 1822–1828. doi:10.1001/archinte.166.17.1822

Correa, J., J. Tian, and E. Bareinboim. "Generalized Adjustment Under Confounding and Selection Biases." AAAI Conference on Artificial Intelligence, 2018, pp. 6335–6342.

Crabtree B.F., P.A. Nutting, W.L. Miller, R.R. McDaniel, K.C. Stange, C.R. Jaen, and E. Stewart. "Primary Care Practice Transformation Is Hard Work: Insights from a 15-Year Developmental Program of Research." *Medical Care*, vol. 49 (suppl.), 2011, pp. S28–35.

Dahabreh, I.J., S.E. Robertson, J.A. Steingrimsson, E.A. Stuart, and M.A. Hernan. "Extending Inferences from a Randomized Trial to a New Target Population." *arXiv,* 1805.00550, 2018.

Dale, S.B., A. Ghosh, D.N. Peikes, T.J. Day, F.B. Yoon, E.F. Taylor, K. Swankoski, et al. "Two-Year Costs and Quality in the Comprehensive Primary Care Initiative." *New England Journal of Medicine,* vol. 374, no. 24, 2016, pp. 2345–2356.

Damschroder, L.J., D.C. Aron, R.E. Keith, S.R. Kirsh, J.A. Alexander, and J.C. Lowery. "Fostering Implementation of Health Services Research Findings into Practice: A Consolidated Framework for Advancing Implementation Science." *Implementation Science,* vol. 4, no. 50, 2009. https://doi.org/10.1186/1748-5908-4-50

Daw, J.R., and L.A. Hatfield. "Matching and Regression to the Mean in Difference-in-Differences Analysis." *Health Services Research,* vol. 53, no. 6, 2018, pp. 4138–4156. doi:10.1111/1475-6773.12993

Degtiar, I., and S. Rose. "A Review of Generalizability and Transportability Across Study Designs." Submitted to Statistical Science and arXiv.

Dorie, V., J. Hill, U. Shalit, M. Scott, and D. Cervone. "Automated Versus Do-It-Yourself Methods for Causal Inference: Lessons Learned From a Data Analysis Competition." *Statistical Science,* vol.34, no. 1, 2019, pp. 43–68.

Dowell, D., T.M. Haegerich, and R. Chou. "CDC Guideline for Prescribing Opioids for Chronic Pain—United States, 2016." *JAMA,* vol. 315, no. 15, 2016, pp. 1624–1645. doi:10.1001/jama.2016.1464

eCQI Resource Center. "Potential Opioid Overuse." Available at https://ecqi.healthit.gov/sites/default/files/ecqm/measures/CMS460v2.html. Accessed July 30, 2021.

Els, C., T.D. Jackson, D. Kunyk, V.G. Lappi, B. Sonnenberg, R. Hagtvedt, S. Sharma, F. Kolahdooz, and S. Straube. "Adverse Events Associated with Medium- and Long-Term Use of Opioids for Chronic Non-Cancer Pain: An Overview of Cochrane Reviews." *Cochrane Database Systematic Reviews,* vol.10, 2017. doi: 10.1002/14651858.CD012509.pub2. Accessed 14 October 2021.

Fay, J. *Evaluating Primary Care Same Day Access as a Method to Reduce Avoidable Hospitalizations Related to Ambulatory Care Sensitive Conditions.* Master's thesis. Johns Hopkins University, 2018. Available at https://jscholarship.library.jhu.edu/bitstream/handle/1774.2/59866/Fay%2c%20Jason.pdf?sequence=1&isAllowed=y.

Flores, C.A., and O.A. Mitnik. "Comparing Treatments Across Labor Markets: An Assessment of Nonexperimental Multiple-Treatment Strategies." *The Review of Economics and Statistics,* vol. 95, no. 5, 2013, pp. 1691–1707. https://doi.org/10.1162/REST_a_00373

Freese, K.E., A. Vega, J.J. Lawrence, and P.I. Documet. "Social Vulnerability Is Associated with Risk of COVID-19 Related Mortality in US Counties with Confirmed Cases." *Journal of Health Care for the Poor and Underserved*, vol. 32, no. 1, 2021, pp. 245–257. doi: 10.1353/hpu.2021.0022

Fu, N., P. Singh, S. Dale, S. Orzol, D. Peikes, A. Ghosh, R. Brown, and T. Day. "Long-Term Effects of the Comprehensive Primary Care Model on Health Care Spending and Utilization." *Journal of General Internal Medicine,* July 8, 2021. doi: 10.1007/s11606-021-06952-w. Epub ahead of print. PMID: 34236603

Gechter, M. "Generalizing the Results from Social Experiments: Theory and Evidence from Mexico and India." Department of Economics, Pennsylvania State University, 2015. Unpublished manuscript.

Gelman, A., J.B. Carlin, H.S. Stern, D.B. Dunson, A. Vehtari, and D. Rubin. *Bayesian Data Analysis.* 3rd ed. London, UK: Chapman & Hall, 2014.

Ghosh, A., S. Orzol, S. Dale, J. Laird, N. Fu, P. Singh, M.-Y. Kim, et al. "Evaluation of the Comprehensive Primary Care Plus Initiative: Second Annual Report, Appendices to the Supplemental Volume." Princeton, NJ: Mathematica, 2020.

Glaser, B., and A. Strauss. *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Piscataway, NJ: Aldine Transaction, 1967.

Green, D., and H. Kern. "Modeling Heterogeneous Treatment Effects in Survey Experiments with Bayesian Additive Regression Trees." *Public Opinion Quarterly,* vol. 76, no. 3, 2012, pp. 491–511.

Green, L.A., H.C. Chang, A.R. Markovitz, and M.L. Paustian. "The Reduction in ED and Hospital Admissions in Medical Home Practices Is Specific to Primary Care-Sensitive Chronic Conditions." *Health Services Research,* vol. 53, no. 2, 2018, pp. 1163–1179.

Hahn, P., J. Murray, and C. Carvalho. "Bayesian Regression Tree Models for Causal Inference: Regularization, Confounding, and Heterogeneous Effects." *arXiv,* vol. 1706.09523v3, 2019, pp. 1–33.

Harrington, D., R.B. D'Agostino Sr., C. Gatsonis, J.W. Hogan, D.J. Hunter, S.-L.T. Normand, J.M. Drazen, and M.B. Hamel. "New Guidelines for Statistical Reporting in the Journal." *NEJM,* vol. 381, no. 3, 2019, pp. 285–286.

Hill, J. "Bayesian Nonparametric Modeling for Causal." *Journal of Computational and Graphical Statistics,* vol. 20, no. 1, 2011, pp. 217–240.

Hsu, J., M. Price, C. Vogeli, R. Brand, M. Chernew, S. Chaguturu, E. Weil, et al. "Bending the Spending Curve by Altering Care Delivery Patterns: The Role of Care Management Within a Pioneer ACO." *Health Affairs,* vol. 36, no. 5, 2017, pp. 876–884.

Islam, N., S.J. Sharp, G. Chowell, S. Shabnam, I. Kawachi, B. Lacey, J.M. Massaro, R. B. D'Agostino, and M. White. "Physical Distancing Interventions and Incidence of Coronavirus Disease 2019: Natural Experiment in 149 Countries." *BMJ,* vol. 370, 2020, m2743. doi: https://doi.org/10.1136/bmj.m2743

Islam, S.A. Nayak, Y. Hu, A. Mehta, K. Dieppa, Z. Almuwaqqat, Y. Ko, S. Patel, A. Goyal, S. Sullivan, T.T. Lewis, V. Vaccarino, A.A. Morris, and A.A. Quyyumi. "Temporal Trends in the Association of Social Vulnerability and Race/ethnicity with County-level COVID-19 Incidence and Outcomes in the USA: An Ecological Analysis." *BMJ Open,* vol. 11, 2021, e048086. doi:10.1136/ bmjopen-2020-048086

Johnston, K.J., L. Allen, T.A. Melanson, and S.R. Pitts. "A 'Patch' to the NYU Emergency Department Visit Algorithm." *Health Services Research*, vol. 52, no. 4, 2017, pp. 1264–1276.

Karaye, I. M., and J. A. Horney. "The Impact of Social Vulnerability on COVID-19 in the U.S.: An Analysis of Spatially Varying Relationships." *American Journal of Preventive Medicine,* vol. 59, no. 3, 2020. doi: 10.1016/j.amepre.2020.06.006

Katcher, B.A., and C.J. Ruhm. "Federal Opioid Grant Funding Favors Least Populous States, Not States with Greatest Need: Study Examines How Closely Federal Grant Dollars Awarded in Fiscal Years 2017–2018 Aligned with the Severity of State Opioid Problems." *Health Affairs,* vol. 40, no. 5, 2021, pp. 829–836.

Kempski, A., and A. Greiner. "Primary Care Spending: High Stakes, Low Investment." Primary Care Collaborative. Washington, DC. Primary Care Collaborative, December 2020. https://www.pcpcc.org/sites/default/files/resources/PCC_Primary_Care_Spending_2020.pdf.

Kern, H., E. Stuart, J. Hill, and D. Green. "Assessing Methods for Generalizing Experimental Impact." *Journal of Research on Educational Effectiveness,* vol. 9, no. 1, 2016, pp. 103–127.

Kern, L.M., J. Seirup, L.P. Casalino, and M.M. Safford. "Healthcare Fragmentation and the Frequency of Radiology and Other Diagnostic Tests." *Journal of General Internal Medicine, vol. 32, no.* 2, 2017, pp. 175–181.

Kranker, K., L. Blue, and L.V. Forrow. "Improving Effect Estimates by Limiting the Variability in Inverse Propensity Score Weights." *The American Statistician,* 2020. doi:10.1080/00031305.2020.1737229

Lehmann, S.W., and M. Fingerhood. "Substance-use Disorders in Later Life." *New England Journal of Medicine,* vol. 379, no. 24, 2018, pp. 2351–2360. https://doi.org/10.1056/NEJMra1805981.

Liebschutz, J.M., Z. Xuan, C.W. Shanahan, et al. "Improving Adherence to Long-term Opioid Therapy Guidelines to Reduce Opioid Misuse in Primary Care: A Cluster-Randomized Clinical Trial." *JAMA Internal Medicine,* vol. 177, no. 9, 2017, pp. 1265–1272. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2643777

McNellis, R.J., J.L. Genevro, and D.S. Meyers. "Lessons Learned from the Study of Primary Care Transformation." *Annals of Family Medicine*, vol. 11, suppl. 1, 2013, pp. S1–S5.

Medicare Payment Advisory Commission (MedPAC). *July 2020 Data Book: Health Care Spending and the Medicare Program.* Accessed May 25, 2021. Available at july2020_databook_entirereport_sec.pdf (medpac.gov).

Meisenberg, B.R., J. Grover, C. Campbell, and D. Korpon. "Assessment of Opioid Prescribing Practices Before and After Implementation of a Health System Intervention to Reduce Opioid Overprescribing." *JAMA Network Open,* vol. 1 no. 5, 2018, p. e182908. doi:10.1001/jamanetworkopen.2018.2908

National Academies of Sciences, Engineering, and Medicine (NAM). *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care.* Washington, DC: The National Academies Press, 2021. doi:10.17226/25983

National Committee for Quality Assurance (NCQA). "HEDIS Volume 2: Technical Specifications." 2015. Available at http://www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures/HEDIS2015.aspx.

National Committee for Quality Assurance (NCQA). "HEDIS Volume 2: Technical Specifications." 2016–2018.

National Committee for Quality Assurance. "HEDIS MY 2020 Medication List Directory." 2020. Available at https://store.ncqa.org/hedis-my-2020-medication-list-directory.html. Accessed July 30, 2021.

National Committee for Quality Assurance. "HEDIS MY 2021 Medication List Directory." 2021. Available at https://store.ncqa.org/hedis-my-2021-medication-list-directory.html. Accessed July 30, 2021.

National Institute on Drug Abuse (NIDA). "Chart of Evidence-based Screening Tools for Adults and Adolescents." Available at https://www.drugabuse.gov/nidamed-medical-health-professionals/tool-resources-your-practice/screening-assessment-drug-testing-resources/chart-evidence-based-screening-tools. Updated May 2021. Accessed October 14, 2021.

Naylor, M.D., L. H. Aiken, E.T. Kurtzman, D.M. Olds, and K.B. Hirschman. "The Importance of Transitional Care in Achieving Health Reform." *Health Affairs,* vol. 30, no. 4, 2011, pp. 746–754.

Nutting P.A., W.L. Miller, B.F. Crabtree, C.R. Jaen, E.E. Stewart, and K.C. Stange. "Initial Lessons from the First National Demonstration Project on Practice Transformation to a Patient-Centered Medical Home." *Annals of Family Medicine*, vol. 7, no. 3, 2009, pp. 254–260.

Nyweide, D.J., D.L. Anthony, J.P. Bynum, R.L. Strawderman, W.B. Weeks, L.P. Casalino, and E.S. Fisher. "Continuity of Care and the Risk of Preventable Hospitalization in Older Adults." *JAMA Internal Medicine,* vol. 173, 2013, pp. 1879–1885.

O'Malley, A.S., Rich, E.C., Shang L., T. Rose, A. Ghosh, D. Poznyak, and D. Peikes. "New Approaches to Measuring the Comprehensiveness of Primary Care Physicians." *Health Services Research, vol. 54,* no. 2, 2019, pp. 356–366.

O'Malley, A.S., E.C. Rich, L. Shang, et al. "Practice-site-level Measures of Primary Care Comprehensiveness and Their Associations with Patient Outcomes." *Health Services Research,* vol. 56, no. 3, 2021, pp. 371–377.

Orzol, S., A. Ghosh, N. Fu, J. Laird, S. Dale, L. Timmins, K. Swankoski, et al. "Evaluation of the Comprehensive Primary Care Plus Initiative: Appendices to the Third Annual Report." Princeton, NJ: Mathematica, 2021.

Østbye, T., K.S. Yarnall, K.M. Krause, K.I. Pollak, M. Gradison, and J.L. Michener. "Is There Time for Management of Patients with Chronic Diseases in Primary Care?" *Annals of Family Medicine,* vol. 3, no. 3, 2005, pp. 209–214.

Oster, A.M., G.J. Kang, A.E. Cha, V. Beresovsky, C.E. Rose, G. Rainisch, and L. Porter. "Trends in Number and Distribution of COVID-19 Hotspot Counties—United States, March 8–July 15, 2020." *Morbidity and Mortality Weekly Report*, vol. 69, no. 33, 2020, pp. 1127–1132. doi: http://dx.doi.org/10.15585/mmwr.mm6933e2

Parchman, M.L., R.B. Penfold, B. Ike, D. Tauben, M. Von Korff, M. Stephens, ... L.M. Baldwin. "Team-based Clinic Redesign of Opioid Medication Management in Primary Care: Effect on Opioid Prescribing." *Annals of Family Medicine,* vol. 17, no. 4, 2019, pp. 319–325.

Pardo, B. "Do More Robust Prescription Drug Monitoring Programs Reduce Prescription Opioid Overdose?" *Addiction,* vol. 11, no. 10, 2017, pp. 1773–1783. Available at https://onlinelibrary.wiley.com/doi/epdf/10.1111/add.13741.

PDMP TTAC. "Maps and Tables." 2021. Available at https://www.pdmpassist.org/Policies/Maps. Accessed September 28, 2021.

Peikes, D., A. Chen, J. Schore, and R. Brown. "Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures Among Medicare Beneficiaries: 15 Randomized Trials." *JAMA,* vol. 301, no. 6, 2018a, pp. 603–618. doi:10.1001/jama.2009.126

Peikes, D., G. Anglin, S. Dale, E.F. Taylor, A. O'Malley, A. Ghosh, K. Swankoski, et al. "Evaluation of the Comprehensive Primary Care Initiative: Fourth Annual Report." Princeton, NJ: Mathematica, 2018b.

Peikes, D., G. Anglin, M. Harrington, et al. "*Independent Evaluation of Comprehensive Primary Care Plus (CPC+): First Annual Report."* Princeton, NJ: Mathematica, April 2019.

Peikes, D., E.F. Taylor, A.S. O'Malley, and E.C. Rich. "The Changing Landscape of Primary Care: Effects of the ACA and Other Efforts Over the Past Decade." *Health Affairs*, vol. 39, no. 3, 2020a, pp. 421–428.

Peikes, D., A. O'Malley, S. Orzol, S. Dale, D. Peterson, K. Geonnotti, N. Duda, et al. "Independent Evaluation of Comprehensive Primary Care Plus (CPC+): Draft Design Report." Princeton, NJ: Mathematica. Unpublished, last modified December 2020b.

Peikes, D., K. Swankoski, A. O'Malley, L. Timmins, D. Petersen, K. Geonnotti, H. Tu, et al. "Evaluation of the Comprehensive Primary Care Plus Initiative: Third Annual Report." Princeton, NJ: Mathematica, 2021.

Peterson, G., S. Dale, and D. Peikes. "Primary and Secondary Tests for the CPC+ Impact Evaluation." Memorandum to CMS. Princeton, NJ: Mathematica Policy Research, May 23, 2018.

Pollack, C.E., P.S. Hussey, R.S. Rudin, D.S. Fox, J. Lai, and E.C. Schneider. "Measuring Care Continuity: A Comparison of Claims-Based Methods." *Medical Care, vol. 54,* no. 5, 2016, pp. e30–e34.

Polyakova, M., V. Udalova, G. Kocks, K. Genadek, K. Finlay, and A. Finkelstein "Racial Disparities in Excess All-Cause Mortality During the Early COVID-19 Pandemic Varied Substantially Across States." *Health Affairs,* vol. 40, no. 2, 2021, pp. 307–316. doi: 10.1377/hlthaff.2020.02142

Pope, G.C., J. Kautter, R.P. Ellis, A.S. Ash, J.Z. Ayanian, L.I. Iezzoni, M.J. Ingber, et al. "Risk Adjustment of Medicare Capitation Payments Using the CMS-HCC Model." *Health Care Financing Review,* vol. 25, no. 4, 2004, pp. 119–141.

Pope, G.C., J. Kautter, M.J. Ingber, S. Freeman, R. Sekar, and C. Newhart. "Evaluation of the CMS-HCC Risk Adjustment Model. Final Report." Research Triangle Park, NC: RTI International, March 2011.

Powell, B.J., T.J. Waltz, M.J. Chinman, L. Damschroder, J.L. Smith, M. M. Matthieu, E.K. Proctor, and J.E. Kirchner. "A Refined Compilation of Implementation Strategies: Results from the Expert Recommendations for Implementing Change (ERIC) Project." *Implementation Science,* vol. 10, no. 21, 2015.

R Core Team. "R Foundation for Statistical Computing." Vienna, Austria, 2018. Available at https://www.R-project.org/.

Reid, R., C. Damberg, and M.W. Friedberg. "Primary Care Spending in the Fee-for-Service Medicare Population." *JAMA Internal Medicine,* vol. 179, no. 7, 2019, pp. :977–980.

Rich, E., D. Lipson, J. Libersky, and M. Parchman. "Coordinating Care for Adults with Complex Care Needs in the Patient-Centered Medical Home: Challenges and Solutions." Agency for Healthcare Research and Quality (AHRQ) Publication No. 12-0010-EF. Rockville, MD: AHRQ, January 2012.

Rich, E.C., A.S. O'Malley, C. Burkhart, L. Shang, A. Ghosh, and M.J. Niedzwiecki. "Primary Care Practices Providing a Broader Range of Services Have Lower Medicare Expenditures and Emergency Department Utilization." *Journal of General Internal Medicine.* Published online March 29, 2021a. doi: 10.1007/s11606-021-06728-2

Rich, E.C., A.S. O'Malley, C. Burkhart, L. Shang, T. Rose, and A. Ghosh. "Report on Measuring Range of Services of Physicians and of Practices in CPC+: Implications for CPC+ and PCF Evaluations." Memo developed for CMS. January 2021b.

Roehrig, C. "Mental Disorders Top the List of the Most Costly Conditions in the United States: $201 Billion." *Health Affairs,* vol. 35, no. 6, 2016, pp. 1130–1135.

Rosano, A., C.A. Loha, R. Falvo, et al. "The Relationship Between Avoidable Hospitalization and Accessibility to Primary Care: A Systematic Review." *European Journal of Public Health,* vol. 23, no. 3, 2013, pp. 356–360.

Rudolph, K., and M. van der Laan. "Robust Estimation of Encouragement Design." *Journal of the Royal Statistical Society Series B Statistical Methodology,* vol. 79, no. 5, 2017, pp. 1509–1525.

Schepis, T.S., D.L. Klare, J.A. Ford, and S.E. McCabe. "Prescription Drug Misuse: Taking a Lifespan Perspective." *Substance Abuse: Research and Treatment,* 2020. https://doi.org/10.1177/1178221820909352.

Seal, K.H., T. Rife, Y. Li, et al. "Opioid Reduction and Risk Mitigation in VA Primary Care: Outcomes from the Integrated Pain Team Initiative." *Journal of General Internal Medicine,* vol. 35, 2020, pp. 1238–1244. https://doi.org/10.1007/s11606-019-05572-9.

Sessums, L.L., S.J. McHugh, and R. Rajkumar. "Medicare's Vision for Advanced Primary Care: New Directions for Care Delivery and Payment." *JAMA*, vol. 315, no. 24, 2016, pp. 2665–2666.

Shwartz, M., E.A. Peköz, J.R. Burgess, C.L. Christiansen, A.K. Rosen, and D. Berlowitz. "A Probability Metric for Identifying High-Performing Facilities: An Application for Pay-for-Performance." *Medical Care,* vol. 52, no. 12, 2014, pp. 1030–1036.

Singh, P., S. Orzol, D. Peikes, E. Oh, and S. Dale. "Characteristics of Practices that Participate in a Primary Care Transformation Model: Evidence from the Comprehensive Primary Care Plus Initiative." *Annals of Family Medicine,* vol. 18, 2020, pp. 309–317.

Song Z. "Mortality Quadrupled Among Opioid-Driven Hospitalizations, Notably Within Lower-Income and Disabled White Populations." *Health Affairs,* vol. 36, no. 12, 2017, pp. 2054–2061.

Stake, R. *The Art of Case Study Research.* Thousand Oaks, CA: SAGE Publications Inc., 1995.

Stan Development Team. *Stan Modeling Language Users Guide and Reference Manual, version 2.18.0.* 2018. Available at http://mc-stan.org. Accessed August 28, 2020.

Starfield, B. *Primary Care Concept, Evaluation and Policy.* New York: Oxford University Press, 1992.

Starfield, B. *Primary Care: Balancing Health Needs, Services and Technology.* New York: Oxford University Press, 1998.

Steiner, J.F., P.A. Braun, P. Melinkovich, et al. "Primary-care Visits and Hospitalizations for Ambulatory-Care–Sensitive Conditions in an Inner-City Health Care System." *Ambulatory Pediatrics,* vol. 3, no. 6, 2003, pp. 324–328.

Strauss, A., and J. Corbin. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.* Newbury Park: Sage Publications, Inc., 1990.

Stuart, E.A., B. Ackerman, and D. Westreich. "Generalizability of Randomized Trial Results to Target Populations: Design and Analysis Possibilities." *Research on Social Work Practice,* vol. 28, no. 5, 2018. pp. 532–537.

Volk, J. et al, "States' Actions to Expand Telemedicine Access During COVID-19 and Future Policy Considerations." Commonwealth Fund issue brief, June 23, 2021. Accessed at https://www.commonwealthfund.org/publications/issue-briefs/2021/jun/states-actions-expand-telemedicine-access-covid-19.

Volkow, N.D. "Collision of the COVID-19 and Addiction Epidemics." *Annals of Internal Medicine,* vol. 173, 2020, pp. 61–62. Available at https://www.acpjournals.org/doi/10.7326/M20-1212

Von Korff, M., et al. "Long-Term Opioid Therapy Reconsidered." *Annals of Internal Medicine,* vol. 155, 2011, pp. 325–328. Available at https://www.acpjournals.org/doi/pdf/10.7326/0003-4819-155-5-201109060-00011.

Wainer, H. "The Most Dangerous Equation." *American Scientist,* vol. 95, no. 3, 2007, pp. 249–256.

Wasserstein, R.L., and N.A. Lazar. "The ASA Statement on p-Values: Context, Process, and Purpose." *The American Statistician,* 2016. doi:10.1080/00031305.2016.1154108

Wasson, J.H., A.E. Sauvigne, R.P. Mogielnicki, et al. "Continuity of Outpatient Medical Care in Elderly Men." *JAMA,* vol. 252, no. 17, 1984, pp. 2413–2417.

Wen, H., et al. "States with Prescription Drug Monitoring Mandates Saw a Reduction in Opioids Prescribed to Medicaid Enrollees." *Health Affairs,* vol. 36, no. 4, 2017, pp. 733–741. Available at https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2016.1141.

Wing, C., K. Simon, and R.A. Bello-Gomez. "Designing Difference in Difference Studies: Best Practices for Public Health Policy Research." *Annual Review of Public Health*, vol. 39, 2018, pp. 453–459.

World Health Organization (WHO). "Primary Health Care: Report of the International Conference on Primary Health Care." Geneva, Switzerland: World Health Organization, 1978.

World Health Organization (WHO). "Nine Steps for Developing a Scaling-Up Strategy." 2010. Available at https://www.who.int/immunization/hpv/deliver/nine_steps_for_developing_a_scalingup_strategy_who_2010.pdf.

Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE). "2019 Hospital-Wide Readmission Measure Updates and Specifications Report – Version 8.0." Prepared for the Centers for Medicare & Medicaid Services, March 2019.

Yin, R.K. *Case Study Research: Design and Methods.* 3rd ed. Thousand Oaks, CA: SAGE Publications Inc, 2009.

Yoon, J., D.E. Rose, I. Canelo, et al. "Medical Home Features of VHA Primary Care Clinics and Avoidable Hospitalizations." *Journal of General Internal Medicine,* vol. 28, no. 9, 2013, pp. 1188–1194.

Yoshikawa, A., G. Ramirez, M.L. Smith, M. Foster, A.K. Nabil, S.N. Jani, and M.G. Ory. "Opioid Use and the Risk of Falls, Fall Injuries and Fractures Among Older Adults: A Systematic Review and Meta-analysis." *Journals of Gerontology: Series A,* vol. 75, no. 10, 2020, pp.1989–1995. https://doi.org/10.1093/gerona/glaa038.

Mathematica Inc.

Princeton, NJ • Ann Arbor, MI • Cambridge, MA
Chicago, IL • Oakland, CA • Seattle, WA
Tucson, AZ • Woodlawn, MD • Washington, DC

EDI Global, a Mathematica Company

Bukoba, Tanzania • High Wycombe, United Kingdom

mathematica.org