The Retaining Employment and Talent After Injury/Illness Network (RETAIN) Demonstration: Evaluation Findings One Year After Enrollment

TECHNICAL APPENDIX

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Introduction

The Retaining Employment and Talent after Injury/Illness Network (RETAIN) demonstration was a collaborative effort by the U.S. Department of Labor (DOL) and the Social Security Administration (SSA) to help workers stay in the labor force after they experience an injury or illness. The goal of RETAIN was to implement and test programs that used early-intervention stay-at-work/return-to-work (SAW/RTW) strategies with adult workers who had recently experienced the onset or exacerbation of an injury or illness that challenged their ability to work. DOL selected five states (Kansas, Kentucky, Minnesota, Ohio, and Vermont) to implement such programs, which were named RETAINWOR*KS*, RETAIN Kentucky [RETAIN KY], Minnesota RETAIN [MN RETAIN], Ohio RETAIN [OH RETAIN], and Vermont RETAIN [VT RETAIN], respectively. The programs began enrolling participants in late 2021 and early 2022 through mid-May 2024. The RETAIN demonstration aimed to build evidence on the effectiveness of SAW/RTW services in supporting the employment and earnings of workers who experience injury or illness and preventing their entry into federal disability programs.

Under contract to SSA, Mathematica conducted an evaluation of the RETAIN programs. The evaluation included an assessment of how each of the five states implemented and operated its program; each program's impacts on enrollee outcomes, including employment, earnings, and applications to SSDI and SSI; and each program's benefits relative to its costs. Each RETAIN program used a random assignment study design so that some enrollees were in a treatment group that could use RETAIN services and others were in a control group that could use limited or no services. In four programs (RETAINWOR*KS*, RETAIN KY, MN RETAIN, and OH RETAIN), random assignment occurred at the individual level. In VT RETAIN, Mathematica randomized primary care clinics into treatment and control groups. To estimate each program's early impacts on enrollee outcomes, we compared the outcomes of treatment and control enrollees.

In an earlier report, the Early Impact Report, we assessed whether each program had impacts on enrollees' outcomes related to service use and outcomes where we might see early signs that the programs are supporting enrollees' ability to stay at or return to work (Patnaik et al. 2025). In the One-Year Evaluation Report, we present findings from participation, impact, and benefit-cost analyses that examine the year after enrollment in the evaluation (Patnaik et al. 2026). These findings are based on analyses of program service use data; administrative data on employment, earnings, and SSA applications and benefits; and a follow-up survey of RETAIN enrollees that Mathematica conducted about one year after enrollment.

In this technical appendix, we provide additional details related to the analyses that form the basis of the RETAIN One-Year Evaluation Report. In Appendix A, we describe the data sources, sample sizes, and measures, and in Appendix B, we describe the analysis methods we used to conduct the one-year impact analyses. In Appendices C through G, we provide additional detail on the results of the analyses that we discussed in the one-year impact report, including the results of sensitivity checks to assess the robustness of final early impact findings to alternative modeling choices.

Appendix A.

Data, Samples, and Measures

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This appendix provides information about the sources of data, samples, and outcome measures we used in the participation, impact, and benefit-cost analyses. Section A describes each data source, including the time periods the data covered; it also describes the approaches we used to address missing data. Section B provides the sample sizes by data source and explains why the samples from some sources were smaller than the full research sample. Section C describes how we constructed each outcome measure examined in the impact analysis, and Section D describes the methods we used for the analysis.

A. Data

In this section, we describe the survey and administrative data used for the analysis. RETAIN states generated some of the data we analyzed; Mathematica collected other data.

1. Data sources

a. RETAIN enrollment data

Every RETAIN program collected information about the characteristics of enrollees at the time of their enrollment in the study through a Participant Enrollment Information Form that DOL developed. The form comprised two parts.

Part 1 of the enrollment form collected contact and demographic information, along with information on health, qualifying injury or illness, recent employment, past application for SSA disability benefits, health insurance coverage, and receipt of various types of unearned income. The data also contained personal identifiers that we used to link these records with the survey data. States provided the evaluation team with Part 1 data through different processes. The four programs using individual random assignment submitted the data through Mathematica's random assignment system at enrollment, whereas the program using clustered random assignment (VT RETAIN) submitted the data to Mathematica in monthly batches. Programs also included a few corrections and updates to Part 1 data in quarterly data submissions from their management information system.[1]

Part 2 of the enrollment form collected details about the qualifying injury or illness and recent employment. Programs provided Mathematica with Part 2 data in their quarterly data submissions.

b. State unemployment insurance wage records

We used state administrative unemployment insurance (UI) wage records to obtain baseline information on enrollees' earnings in the quarter before enrollment in RETAIN, as well as to track earnings in the four quarters following enrollment. The five RETAIN programs supplied the individual-level quarterly UI wage data necessary to carry out the final impact analyses. Each program provided six variables that captured earnings in the quarter before, quarter of, and four quarters after enrollment.

State UI wage records provided the evaluation team with valuable information about enrollees' employment before joining the RETAIN programs. We used earnings in the quarter before enrollment as a proxy for enrollees' employment quality before their injury or illness—an important control in the impact analysis because earnings and employment quality before injury might be correlated with SAW/RTW

[1] For enrollee characteristics that we used to stratify random assignment, we used the data that programs submitted at the time of random assignment rather than quarterly data submissions. This ensured that the impact analysis models accurately adjusted for the stratified random assignment design.

outcomes after enrollment in RETAIN. We also used state UI wage data to construct measures of employment and earnings in the four quarters after enrollment, enabling us to assess the program's impact on these outcomes.

The limitations of state UI wage records are that they exclude out-of-state employment and typically exclude records for self-employed individuals, independent contractors, federal employees, agricultural workers, and workers in the informal or gig economy. UI records also might exclude people who earn below a minimum threshold or work in industries not covered by UI laws. In addition, there is typically a lag in these data so that states might update the records several quarters later. Therefore, the data we used for the last two quarters in our analysis period (Quarter 1 and Quarter 2 of 2025) might be less reliable than data from earlier quarters.

c. SSA program data

We obtained information on applications to SSDI and SSI from the Structured Data Repository. The Structured Data Repository is a relational database used to collect disability data during the processing and development of disability claims. These data include information on date of application and applicant characteristics.[2] We used data from October 2021 through May 2025, which covered the 12 months after RA for all enrollees. We included initial applications at all adjudicative levels. We excluded continuing disability reviews.

We obtained information about SSDI and SSI receipt and monthly benefit amounts from the Master Beneficiary Record and Supplemental Security Record, respectively. The Master Beneficiary Record contains data about Old-Age, Survivors, and Disability Insurance benefits. However, we have used the term SSDI to describe these benefits because the large majority of enrollees receive Old-Age, Survivors, and Disability Insurance benefits based on a disability (that is, disability insurance rather than retirement benefits). We used data from November 2021 through June 2025, which covered the 12 months after the month of enrollment for all enrollees. For both SSDI and SSI, we measured benefits paid instead of due because we wanted to capture outlays by SSA when measuring costs and net benefits.[3] For SSDI, we included the benefits enrollees received as primary beneficiaries and the benefits of any auxiliaries to the enrollees (for example, disabled adult child or disabled widow/widower benefits). For SSI, we included only federal SSI payments and excluded state supplemental payments to facilitate cross-state comparisons. Of the five RETAIN states, all offer state supplemental payments, but only Vermont's are administered by SSA and therefore available in the Supplemental Security Record.

d. One-year follow-up survey of enrollees

We conducted a survey of enrollees about one year after enrollment. Mathematica designed the survey to capture information not available from other data sources. Enrollee survey topics included employment

[2] The Structured Data Repository excludes some applications that were denied based on a non-medical eligibility requirement (technical denials).

[3] This approach captures benefits paid including any overpayments and underpayments during the one-year follow-up period. If someone applied for SSDI or SSI benefits during their 12-month follow-up period but was not approved until after the follow-up period, we did not capture the benefits due during the one-year follow-up period that they would be paid via a back payment after that period.

and earnings, economic well-being (including household income and earnings and receipt of public benefits), and health and functioning.

We fielded the one-year follow-up survey from January 2023 to August 2025. We attempted to survey all enrollees in all the RETAIN programs except OH RETAIN. For that program, we implemented a survey sampling approach to target 3,500 enrollees, a sample we determined would yield sufficient power to detect impacts. We fielded the survey with all OH RETAIN enrollees up to cohort 25, corresponding to people enrolled before October 2023. For cohort 25 and later, we fielded the survey with a random sample of enrollees. Based on projected enrollment in each month from October 2023 to May 2024, we sampled a pre-determined number of enrollees in each month to reach a total sample of 3,500. Specifically, we sampled 80 enrollees from each of cohorts 25 through 28, 68 from cohort 29, 48 from cohort 30, 35 from cohort 31, and 12 from cohort 32.

To simplify the survey management process, we aggregated enrollees into 32 cohorts corresponding to their month of enrollment. In each month from January 2023 to May 2025, we released a cohort to be surveyed.[4] Exhibit A.1 shows the start and end dates of survey fielding for each cohort and the RETAIN programs represented in each.

Exhibit A.1. Schedule for the one-year follow-up survey

Cohort	Month enrolled	Fielding start month	Fielding end month	Number of enrollees included in each cohort				
				RETAIN WORKS	RETAIN KY	MN RETAIN	OH RETAIN	VT RETAIN
1	10/21	1/23	6/23	5	11			
2	11/21	1/23	6/23	5	14			
3	12/21	1/23	6/23	2	12	1		
4	1/22	1/23	6/23	1	24	45	9	
5	2/22	2/23	9/23	6	13	43	89	
6	3/22	3/23	10/23	3	22	46	111	2
7	4/22	4/23	9/23	3	18	38	133	14
8	5/22	5/23	11/23	7	39	51	137	7
9	6/22	6/23	11/23	7	45	57	131	14
10	7/22	7/23	1/24	7	26	68	99	12
11	8/22	8/23	2/24	15	39	59	144	14
12	9/22	9/23	1/24	9	37	51	141	20
13	10/22	10/23	4/24	16	24	46	172	13
14	11/22	11/23	4/24	17	28	85	236	16
15	12/22	12/23	6/24	18	49	105	178	7
16	1/23	1/24	8/24	22	51	108	140	9
17	2/23	2/24	8/24	19	64	79	164	5
18	3/23	3/24	9/24	31	134	127	155	9
19	4/23	4/24	10/24	48	129	126	151	11

[4] Because few people enrolled in RETAIN during the first four months of the enrollment period, we launched one cohort in January 2023, corresponding to people who enrolled in RETAIN between October 2021 and January 2022.

Cohort	Month enrolled	Fielding start month	Fielding end month	Number of enrollees included in each cohort				
				RETAIN WORKS	RETAIN KY	MN RETAIN	OH RETAIN	VT RETAIN
20	5/23	5/24	11/24	50	156	128	155	19
21	6/23	6/24	11/24	36	131	110	167	28
22	7/23	7/24	1/25	34	155	134	143	39
23	8/23	8/24	3/25	51	147	209	187	40
24	9/23	9/24	3/25	35	195	196	177	47
25	10/23	10/24	4/25	59	190	189	80	46
26	11/23	11/24	5/25	57	167	197	80	65
27	12/23	12/24	8/25	86	162	157	80	21
28	1/24	1/25	7/25	80	200	185	80	68
29	2/24	2/25	8/25	54	201	183	68	50
30	3/24	3/25	8/25	73	196	275	48	66
31	4/24	4/25	8/25	66	284	77	35	94
32	5/24	4/25	8/25	38	171		12	62
Total	-	-	-	**960**	**3,134**	**3,175**	**3,502**	**798**

Note: Fielding end month is defined as the last month a cohort member completed a survey.

We administered the surveys in English and Spanish in three modes: web, paper, and over the telephone with a professional interviewer. All three modes used the same instrument. We offered enrollees an incentive of $30 for completing the survey, with $5 prepaid to encourage completion of the survey and the remaining $25 paid after completing the survey. Approximately 67 percent of respondents completed the survey by web, 32 percent by phone, and 1 percent by paper. Few respondents (0.4 percent) completed the survey in Spanish. We considered a survey to be complete if the respondent provided information about their employment status, work hours, and earnings (if employed).

Among enrollees whom we attempted to survey, some did not respond to the survey because they could not be located, were located but refused to respond, or did not participate in the survey for other reasons. As shown in Exhibit A.2, the survey response rates were high (more than 72 percent for each program), and the differences in response rates between treatment and control sample members were small (less than 2.3 percentage points for any program).

Exhibit A.2. One-year follow-up survey response rates, by program (percentages)

Random assignment group	RETAIN-WORKS	RETAIN KY	MN RETAIN	OH RETAIN	VT RETAIN	All programs
Treatment	76.3	72.8	75.2	78.6	76.2	75.7
Control	76.2	73.1	73.8	76.3	77.3	74.8
Eligible sample	960	3,134	3,175	3,499	798	11,566

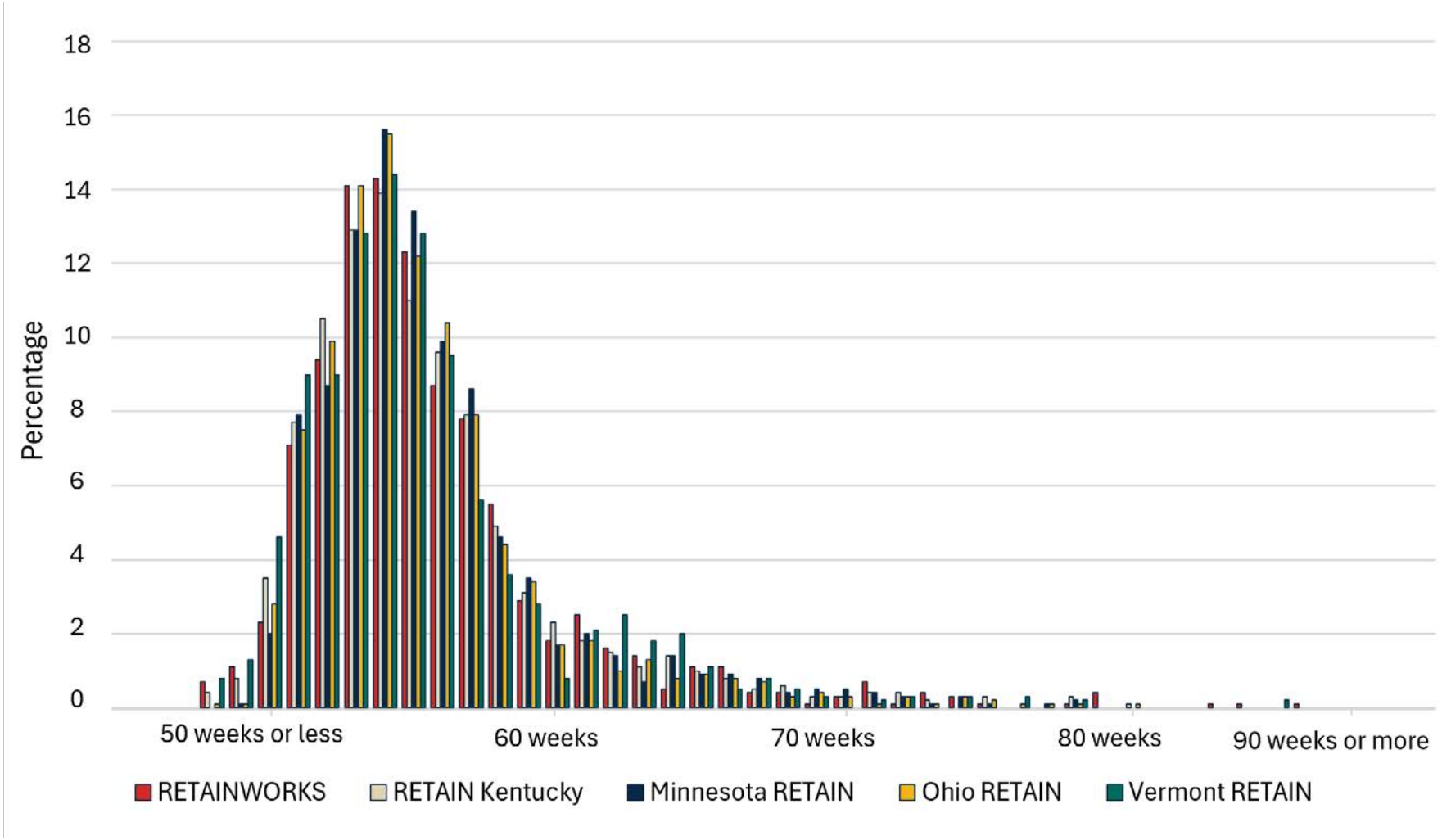
Source: RETAIN enrollment data and one-year follow-up survey.

Note: The eligible sample comprises all enrollees who were randomly assigned except enrollees who were enrolled in error (n = 6), experienced contamination (n = 5), chose to withdraw from the evaluation (n = 1), chose to withdraw from the survey but remain in the evaluation (n = 3), died during the fielding of the one-year survey (n = 53), or were OH RETAIN enrollees who were not sampled for the survey (n = 1,016). It excludes wildcard enrollees who did not undergo random assignment (n = 3).

The median time between enrollment and completion of the one-year survey was 55 weeks, or a little over 12 months (Exhibit A.3).[5] About 95 percent of survey respondents completed the survey within 65 weeks (or about 15 months) of enrollment.

[5] For survey administration, we collapsed enrollees into cohorts based on their month of enrollment. Because of this approach, someone who enrolled at the end of a month would become eligible for the survey earlier than someone who enrolled at the beginning of that same month. Such differences in the timing of becoming eligible for the survey could have contributed to variation in survey response times.

Exhibit A.3. Time between enrollment and survey completion, by program



Source: RETAIN enrollment data and one-year follow-up survey.

Notes: The figure shows the share of the respondents in each program who completed the one-year follow-up survey, by week after enrollment.

2. Approaches for addressing missing data

For a variety of reasons, data were missing for some enrollees. Survey data were not available for some sample members because of survey and item nonresponse. More rarely, enrollment data were missing because of skipped responses in the enrollment form. Below, we describe the approaches we used to address missing data on baseline characteristics and survey outcomes.

a. Missing enrollment data due to nonresponse or unavailability

Most baseline characteristics of enrollees came from RETAIN enrollment data, which had low levels of missingness. For the baseline characteristics we used in the analyses, only a small fraction of observations had missing data, which we replaced with imputed values to avoid excluding observations with missing data from the analyses. For continuous and binary baseline measures with missing data, we replaced the missing values with the program-specific mean values for the observations for which data were not missing. For categorical baseline measures, we added a category to indicate missing data.

b. Missing data due to survey sampling or survey nonresponse

We attempted to field the one-year survey to all enrollees in all the RETAIN programs except OH RETAIN. For OH RETAIN, we fielded the survey with all enrollees up to cohort 25, corresponding to people enrolled before October 2023. For cohorts 25 and later, we fielded the survey to a random sample of enrollees. Based on projected enrollment in each month from October 2023 to May 2024, we sampled a predetermined number of enrollees in each month to reach a total sample of 3,500. Specifically, we sampled 80 enrollees from each of cohorts 25 through 28, 68 from cohort 29, 48 from cohort 30, 35 from cohort 31, and 12 from cohort 32. For enrollees in these cohorts, we developed a sampling weight corresponding to the inverse of the probability of being sampled. For example, if we sampled 80 out of 186 enrollees in January 2024, their probability of being sampled was 0.43, and their sampling weight was 2.33.

As with any survey with less than a 100 percent response rate, there is the potential for survey respondents to differ systematically from nonrespondents. Among survey respondents, if the baseline characteristics of treatment and control groups are not equivalent, survey nonresponse could introduce bias in the impact estimates. In addition, numerous and large differences in the baseline characteristics of survey respondents and nonrespondents would mean that any impacts estimated using survey data might not be generalizable to all enrollees.

We assessed the extent to which survey nonresponse might limit generalizability of the final impact findings by examining data on baseline characteristics. In Exhibits A.4–A.8, we present baseline characteristics of all enrollees, survey respondents, and survey nonrespondents, separately by program. We compared the baseline characteristics between survey respondents and nonrespondents and checked whether the differences were statistically significant.

Across all states, respondents for the one-year follow-up survey were on average older than nonrespondents and more likely to have a four-year college or postgraduate degree. In all programs except VT RETAIN, respondents were more likely to be women than nonrespondents. In all programs except OH RETAIN, respondents were more likely to be employed at enrollment. In three programs (RETAINWOR*KS*, RETAIN KY, and MN RETAIN), respondents had higher earnings in the quarter before

enrollment than nonrespondents. Other differences varied by program. Overall, the differences between the two groups were small even when statistically significant, which suggests that the respondents were not markedly different from the nonrespondents. Nonetheless, to adjust for these differences, we calculated and used survey weights (separately by program) in all regression models.

To build the nonresponse weights, we started by predicting each person's likelihood of responding to the survey. We used a random forest model, drawing on enrollees' baseline characteristics and their random assignment group. In early tests, this approach performed better than the traditional method of logistic regression. The baseline characteristics we used were the same core factors included in our later impact regression models.

To make sure the random forest model was accurate but not too complex, we tested different ways of setting two key parameters: how deep the trees could grow and the minimum number of people in each group at the end of a tree. We used a method called cross-validation, which involves splitting the data into parts, training the model on some of the data, and testing it on the rest. By repeating this process multiple times, we identified the parameter settings that gave the best overall performance.

Using these optimized hyperparameters, we then estimated the random forest model separately for each state. For every person, the model assigned a probability of survey response. We created nonresponse weights by taking the inverse of these probabilities, giving more weight to people less likely to respond, and then normalizing so that the total weights matched the number of enrollees. In most states, these nonresponse weights were used directly in the analysis. In Ohio, we also incorporated the sampling weights by multiplying them with the nonresponse weights before normalizing to maintain consistency with the number of enrollees.

In Columns E and F of Exhibits A.4–A.8, we report the baseline characteristics of the weighted respondent sample (that is, the sample of respondents after applying the nonresponse weights), and the differences between all enrollees and the weighted respondent sample, respectively. To assess the effectiveness of our weights in making the respondent sample more representative of all program enrollees, we tested whether the differences in column E were statistically significant and found that few were. Further, the differences between enrollees and weighted respondents (column F) are substantially smaller or non-existent compared to the differences between respondents and nonrespondents (column D), which confirms that the weights sufficiently account for survey sampling and nonresponse.

c. Missing data due to non-valid Social Security numbers

We were unable to verify the Social Security number (SSN) for 255 enrollees using SSA's Enumeration Verification System.[6] For outcomes that rely on administrative data (all measures of SSA program participation and the measures of employment and earnings derived from state UI wage records), we set the outcomes to "missing" for enrollees with SSNs that we could not verify. Not being able to verify an SSN does not necessarily mean the enrollee did not have earnings or participate in SSA programs; conversely, data for an unverified SSN could reflect the earnings or program participation of a different person. Because we could not confidently interpret the outcomes data for enrollees with unverified SSNs, we set their administrative outcomes data to "missing."

[6] Mathematica did not have direct access to the Enumeration Verification System. SSA conducted the verification.

d. Missing data due to survey item nonresponse

Sometimes, survey respondents did not answer one or more questions on the survey, resulting in item-level nonresponse. These cases included respondents who refused to answer or did not know the answer to a question. When it was reasonable to assume that the outcome data were missing at random, we excluded observations with missing data from the analyses of those outcomes.

For some outcome measures, data were missing nonrandomly—that is, data were missing conditional on certain values of other outcome measures. For example, some enrollees reported that they were working at the time of the survey but did not respond to the question about their average weekly earnings. Because this question was asked only of people who were working at the time of the survey, omitting observations with missing earnings data would lead to biased estimates of the impact of RETAIN on earnings. The bias would stem from nonrandom missing observations that compromise the use of random assignment to estimate effects.

To eliminate the risk of such bias when we analyzed outcomes for which information could be missing only conditional on another outcome, we used a multiple imputation procedure that allowed us to retain observations that had truly missing data on the outcome to be analyzed.[7] We used multivariate imputation by chained equations to impute outcomes with conditionally missing values (Raghunathan et al. 2001; Van Buuren 2007) and predictive mean matching (Little 1988; Rubin 1986). A key feature of the multiple imputation approach is that it accounts for imputation uncertainty; common single imputation methods, such as mean-replacement imputation or hot decking, do not account for this uncertainty. As a result, standard errors from data based on single imputation methods may be understated, thus affecting inferences drawn from the data.

We conducted the multiple imputation procedure separately for each program. First, we developed predicted values for the missing cases of each variable using a multivariate regression model and a random disturbance term. The covariates included the core covariates, stratification factors, and random assignment group. Then, using predictive mean matching, we matched each missing data point to the 10 nonmissing cases with the closest predicted values. Next, we randomly selected one of the 10 matched cases to assign the value of that case to the missing data. We iterated this imputation procedure 10 times and created 10 imputed data sets. In other words, we estimated 10 replacement values for each missing case. After completing the imputation, we estimated impacts separately on each of the 10 imputed data sets. We then combined the impact estimates using the approach described in Rubin (1987), which accounts for the uncertainty created by imputing data and adjusts the standard error of impacts appropriately.

[7] We used multiple imputation for the following outcomes: (1) conditional on not connected to an employer: connected to an employer or looking for work; (2) conditional on not working at a job: not working but planning to return to work in the next 90 days; (3) conditional on working at a job: usual hours worked, average weekly pay, working for an employer offering health insurance, working for an employer offering paid leave, working and received advice about modifying job or workplace, and working and employer offering the chance to return to work with needed accommodations.

Exhibit A.4. RETAINWOR*KS*: Baseline characteristics of all enrollees, survey respondents, and survey nonrespondents (percentage unless otherwise noted)

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Demographic characteristics						
Sex						
Female	61.5	63.9	53.7	10.2***	63.7	2.2
Age				†††		
18–29	16.6	13.7	25.8	-12.1	15.1	-1.6
30–39	22.8	20.8	29.2	-8.4	21.6	-1.3
40–44	13.4	14.1	11.3	2.8	13.9	0.5
45–49	13.3	13.5	12.7	0.8	13.4	0.1
50–54	12.7	13.7	9.4	4.3	13.3	0.6
55–59	11.1	12.2	7.7	4.5	11.7	0.6
60 and older	10.1	12.0	3.9	8.1	11.0	1.0
Average (years)	43.1	44.5	38.6	5.9***	43.9	0.8
Race and ethnicity						
Hispanic	9.3	10.5	5.7	4.8	10.1	0.7
White, non-Hispanic	72.0	71.5	73.5	-2.0	71.8	-0.2
Black, non-Hispanic	12.4	11.6	14.7	-3.1	11.8	-0.6
Asian, non-Hispanic	0.7	s	s	-0.9	s	-0.2
More than one race	3.1	3.4	2.2	1.2	3.2	0.1
Other, non-Hispanic	2.2	2.2	2.0	0.2	2.3	0.1
Missing	0.3	s	s	-0.2	s	-0.1
Preferred language				†††		
English	99.3	99.0	100.0	-1.0	99.0	-0.2
Spanish	0.7	1.0	0.0	1.0	1.0	0.2

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Other	0.0	0.0	0.0	0.0	0.0	0.0
Education				++		
Less than a high school diploma	5.1	5.3	4.6	0.7	5.1	-0.0
High school diploma, GED, or certificate of completion	45.6	44.2	50.0	-5.9	43.8	-1.8
Occupational certificate, license, or two-year college degree	29.7	29.1	31.4	-2.3	29.5	-0.2
Four-year college or postgraduate degree	19.6	21.4	14.0	7.4	21.6	2.0‡
Injury or Illness characteristics						
Type of injury or illness						
Musculoskeletal, back	17.1	17.2	17.0	0.2	17.5	0.4
Musculoskeletal, non-back	49.3	50.6	45.1	5.5	50.2	0.9
Mental	7.4	6.2	s	-4.7	6.3	-1.1
Other	25.4	25.1	26.4	-1.3	25.3	-0.1
Missing	0.7	0.8	s	0.3	0.7	0.0
New injury or illness	46.9	46.6	47.9	-1.3	45.6	-1.3
Injury or result of an accident	47.9	46.9	50.8	-3.8	46.0	-1.8
Work-related injury or illness	29.5	29.7	28.8	0.9	29.5	0.0
Injury or illness as part of a workers' compensation claim	17.9	17.5	19.1	-1.6	17.3	-0.6
Time between injury or illness and enrollment						
Total days	39	40	36	4*	40	1
Enrolled before onset of injury or illness	s	s	0.0	s	s	0.0
Missing	0.0	0.0	0.0	0.0	0.0	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Recent work history						
Employment status at enrollment				†		
Not employed	19.2	18.7	20.9	-2.2	19.2	-0.0
Self-employed	4.3	3.4	7.1	-3.7	3.8	-0.5
Employed	76.5	78.0	72.0	5.9	77.0	0.5
Time since last worked at enrollment						
Working at enrollment	35.8	37.8	29.5	8.3	37.0	1.1
Last worked less than one week before	16.2	16.3	15.8	0.6	16.1	-0.1
Last worked one to four weeks before	17.0	15.7	21.1	-5.4	16.1	-0.9
Last worked one to three months before	15.3	14.5	17.7	-3.3	14.8	-0.5
Last worked more than three months before	15.7	15.6	15.8	-0.2	16.0	0.3
Hours per week usually worked before injury or illness	40.6	40.7	40.3	0.4	40.6	0.0
Tenure at most recent job						
Fewer than six months	23.1	21.0	29.6	-8.7	20.6	-2.5‡
Six months to one year	12.8	13.4	10.8	2.6	13.2	0.4
One to two years	17.7	17.8	17.0	0.8	17.8	0.1
Two to five years	19.4	19.6	18.9	0.7	19.5	0.1
More than five years	27.1	28.2	23.7	4.5	29.0	1.9
Occupational classification of pre-injury or pre-illness job						
Management, professional, or related	28.1	29.2	24.8	4.4	29.6	1.5
Service	35.4	33.2	42.3	-9.0	33.4	-2.0
Sales and office	9.2	9.6	8.0	1.6	9.9	0.7
Natural resources, construction, or maintenance	8.0	8.3	7.0	1.3	7.8	-0.2
Production, transportation, or material moving	19.2	19.6	17.9	1.8	19.3	0.1

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Missing	0.0	0.0	0.0	0.0	0.0	0.0
Economic well-being						
Earnings in the quarter before the enrollment quarter ($)	7,977	8,201	7,268	932**	8,138	161
Earned $1,000 or more in one of the past 12 months	80.2	79.8	81.5	-1.7	79.1	-0.5
Receipt of income other than earnings						
Social Security disability (SSDI or SSI)	s	0.0	s	s		s
Veteran's benefits	2.0	1.9	2.1	-0.2	0.0	-0.1
Workers' compensation	5.4	5.5	5.1	0.4	5.5	0.1
Employer-provided or other private disability insurance	7.6	7.8	7.0	0.8	7.6	0.1
Other public programs	2.9	2.9	3.0	-0.1	2.9	0.0
Applied for or received SSDI or SSI in the past three years	5.2	5.3	4.9	0.3	5.5	0.3
Covered by health insurance	86.9	88.1	83.3	4.7*	88.3	1.4
Total number of enrollees	**963**	**732**	**231**		**732**	

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: In column D, we compared the baseline characteristics of respondents (column B) to enrollees who did not respond to the one-year follow-up survey (column C). For continuous or binary variables, we conducted a two-tailed t-test, and for multinomial categorical variables, we conducted an F-test of joint significance across all categories. In column E, we show the baseline characteristics of weighted survey respondents. In column F, we compared the baseline characteristics of all enrollees (column A) to weighted survey respondents (column E). For each mean or proportion, we assessed whether the effect size of the difference, in absolute value, was greater than 0.05.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

‡ = Absolute value of the effect size is greater than 0.05

Exhibit A.5. RETAIN KY: Baseline characteristics of all enrollees, survey respondents, and survey nonrespondents (percentage unless otherwise noted)

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted enrollees (E)	Difference between weighted respondents and all enrollees (F)
Demographic characteristics						
Sex						
Female	61.1	64.9	51.2	13.6***	62.5	1.3
Age				†††		
18–29	18.1	15.9	23.8	-7.9	16.9	-1.2
30–39	27.2	26.6	28.7	-2.1	27.1	-0.1
40–44	14.3	14.6	13.5	1.0	14.6	0.4
45–49	12.3	12.1	12.7	-0.6	12.2	-0.1
50–54	11.6	12.3	9.7	2.7	11.9	0.3
55–59	8.5	9.4	6.2	3.3	9.0	0.5
60 and older	8.0	9.0	5.4	3.6	8.3	0.3
Average (years)	41.7	42.6	39.4	3.1***	42.1	0.4
Race and ethnicity						
Hispanic	3.2	3.3	2.9	0.4	3.3	0.1
White, non-Hispanic	74.2	75.1	72.1	2.9	74.8	0.5
Black, non-Hispanic	16.1	15.5	17.5	-2.0	15.8	-0.3
Asian, non-Hispanic	0.6	0.6	0.6	0.0	0.6	-0.0
More than one race	5.1	4.8	5.7	-0.9	4.9	-0.2
Other, non-Hispanic	0.3	0.3	0.4	0.0	0.3	-0.0
Missing	0.5	0.3	0.8	-0.5	0.4	-0.1
Preferred language						
English	99.2	99.2	99.1	0.1	99.3	0.0
Spanish	0.2	0.2	s	0.1	0.3	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted enrollees (E)	Difference between weighted respondents and all enrollees (F)
Other	0.6	0.5	s	-0.2	0.5	-0.1
Education				†††		
Less than a high school diploma	6.7	5.1	10.7	-5.6	5.0	-1.7‡
High school diploma, GED, or certificate of completion	48.0	47.5	49.6	-2.1	47.4	-0.6
Occupational certificate, license, or two-year college degree	22.0	22.1	21.8	0.3	22.3	0.3
Four-year college or postgraduate degree	23.3	25.3	17.9	7.4	25.3	2.0
Injury or Illness characteristics						
Type of injury or illness				†††		
Musculoskeletal, back	9.3	10.0	7.5	2.5	9.6	0.3
Musculoskeletal, non-back	16.6	17.7	13.7	4.0	16.9	0.3
Mental	33.0	29.9	41.0	-11.1	31.9	-1.1
Other	40.3	41.6	37.0	4.6	40.9	0.5
Missing	0.7	0.7	0.8	-0.2	0.7	-0.1
New injury or illness	18.3	18.2	18.6	-0.4	17.6	-0.7
Injury or result of an accident	19.1	20.3	15.9	4.4***	19.4	0.2
Work-related injury or illness	5.8	6.2	4.6	1.6*	6.3	0.6
Injury or illness as part of a workers' compensation claim	1.1	1.1	1.3	-0.2	1.1	-0.1
Time between injury or illness and enrollment						
Total days	45	45	44	1	45	0
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	0.0	0.0
Missing	0.0	0.0	0.0	0.0	0.0	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted enrollees (E)	Difference between weighted respondents and all enrollees (F)
Recent work history						
Employment status at enrollment				†††		
Not employed	34.8	31.4	43.7	-12.2	34.6	-0.2
Self-employed	4.6	4.6	4.5	0.1	4.5	-0.0
Employed	60.6	64.0	51.8	12.1	60.9	0.3
Time since last worked at enrollment				†††		
Working at enrollment	27.5	31.2	17.9	13.3	28.3	0.8
Last worked less than one week before	20.5	20.9	19.2	1.7	20.4	-0.1
Last worked one to four weeks before	14.5	13.7	16.5	-2.8	14.3	-0.1
Last worked one to three months before	18.1	16.0	23.7	-7.7	17.3	-0.8
Last worked more than three months before	19.4	18.2	22.7	-4.5	19.7	0.3
Hours per week usually worked before injury or illness	37.1	37.0	37.2	-0.2	36.9	-0.2
Tenure at most recent job				†††		
Fewer than six months	33.2	30.8	39.5	-8.8	31.1	-2.1
Six months to one year	15.6	16.6	13.2	3.4	16.4	0.8
One to two years	13.4	13.4	13.4	0.0	13.3	-0.1
Two to five years	16.9	17.6	15.0	2.6	17.5	0.7
More than five years	20.9	21.7	18.9	2.8	21.7	0.8
Occupational classification of pre-injury or pre-illness job				†††		
Management, professional, or related	27.4	28.8	23.6	5.2	28.9	1.5
Service	39.9	38.8	42.9	-4.1	39.3	-0.6
Sales and office	8.5	9.7	5.4	4.2	9.7	1.2
Natural resources, construction, or maintenance	6.5	5.5	9.0	-3.6	5.2	-1.3‡
Production, transportation, or material moving	17.7	17.2	19.0	-1.8	16.9	-0.9

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted enrollees (E)	Difference between weighted respondents and all enrollees (F)
Missing	0.0	0.0	0.0	0.0	0.0	0.0
Economic well-being						
Earnings in the quarter before the enrollment quarter ($)	6,395	6,633	5,767	866***	6,484	88
Earned $1,000 or more in one of the past 12 months	81.0	81.5	79.8	1.8	81.2	0.1
Receipt of income other than earnings						
Social Security disability (SSDI or SSI)	0.8	0.8	0.7	0.2	0.9	0.1
Veteran's benefits	1.5	1.4	1.5	-0.1	1.4	-0.0
Workers' compensation	0.1	0.0	0.4	-0.4*	0.0	-0.1
Employer-provided or other private disability insurance	5.0	4.7	6.0	-1.3	4.5	-0.5
Other public programs	11.4	9.6	16.3	-6.7***	10.1	-1.3
Applied for or received SSDI or SSI in the past three years	2.4	2.8	1.4	1.4**	2.8	0.4
Covered by health insurance	93.0	93.0	92.9	0.2	93.1	0.2
Total number of enrollees	**3,153**	**2,287**	**866**		**2,287**	

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: In column D, we compared the baseline characteristics of respondents (column B) to enrollees who did not respond to the one-year follow-up survey (column C). For continuous or binary variables, we conducted a two-tailed t-test, and for multinomial categorical variables, we conducted an F-test of joint significance across all categories. In column E, we show the baseline characteristics of weighted survey respondents. In column F, we compared the baseline characteristics of all enrollees (column A) to weighted survey respondents (column E). For each mean or proportion, we assessed whether the effect size of the difference, in absolute value, was greater than 0.05.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

‡ = Absolute value of the effect size is greater than 0.05

Exhibit A.6. MN RETAIN: Baseline characteristics of all enrollees, survey respondents, and survey nonrespondents (percentage unless otherwise noted)

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between all enrollees and weighted respondents (F)
Demographic characteristics						
Sex						
Female	55.1	58.2	46.3	12.0***	57.0	1.9
Age				†††		
18–29	17.5	14.2	26.9	-12.7	16.5	-1.1
30–39	24.1	22.4	28.8	-6.4	23.2	-0.9
40–44	13.2	13.2	12.9	0.3	13.1	-0.1
45–49	12.6	13.1	11.0	2.1	12.8	0.2
50–54	12.8	14.0	9.4	4.5	13.4	0.6
55–59	11.0	12.4	7.0	5.3	11.5	0.5
60 and older	8.8	10.6	3.8	6.8	9.5	0.7
Average (years)	42.5	44.0	38.3	5.7***	43.1	0.6
Race and ethnicity				†††		
Hispanic	7.6	7.4	8.1	-0.7	7.5	-0.1
White, non-Hispanic	74.3	76.2	68.8	7.4	75.5	1.2
Black, non-Hispanic	9.8	9.0	11.9	-2.9	9.3	-0.4
Asian, non-Hispanic	1.8	1.8	1.6	0.2	1.8	0.0
More than one race	3.9	3.5	5.0	-1.5	3.7	-0.2
Other, non-Hispanic	1.8	1.3	3.4	-2.1	1.5	-0.4
Missing	0.9	0.8	1.3	-0.5	0.8	-0.1
Preferred language				††		
English	97.5	97.8	96.4	1.4	97.8	0.3
Spanish	1.1	1.1	1.0	0.0	1.1	0.1

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between all enrollees and weighted respondents (F)
Other	1.5	1.1	2.5	-1.4	1.1	-0.4
Education				†††		
Less than a high school diploma	3.6	2.6	6.5	-3.8	2.7	-1.0‡
High school diploma, GED, or certificate of completion	38.1	36.1	43.5	-7.4	35.8	-1.4
Occupational certificate, license, or two-year college degree	25.4	25.8	24.2	1.6	26.3	0.9
Four-year college or postgraduate degree	32.9	35.4	25.8	9.6	35.2	2.3
Injury or Illness characteristics						
Type of injury or illness				†††		
Musculoskeletal, back	10.4	10.1	11.3	-1.2	10.4	-0.0
Musculoskeletal, non-back	49.7	50.5	47.2	3.3	50.4	0.7
Mental	14.2	12.8	18.2	-5.3	13.1	-1.1
Other	25.7	26.5	23.3	3.2	26.1	0.4
Missing	0.0	0.0	0.0	0.0	0.0	0.0
New injury or illness	44.6	44.5	45.0	-0.5	43.8	-0.8
Injury or result of an accident	39.5	39.8	38.6	1.2	39.4	-0.1
Work-related injury or illness	14.1	14.4	13.0	1.4	14.5	0.5
Injury or illness as part of a workers' compensation claim	5.2	5.4	4.5	0.9	5.4	0.2
Time between injury or illness and enrollment						
Total days	41	41	41	1	41	-0
Enrolled before onset of injury or illness	7.3	7.9	5.3	2.6***	8.0	0.7
Missing	0.0	0.0	0.0	0.0	0.0	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between all enrollees and weighted respondents (F)
Recent work history						
Employment status at enrollment				†††		
Not employed	15.2	13.8	19.2	-5.5	14.9	-0.3
Self-employed	8.1	8.1	8.0	0.1	8.2	0.2
Employed	76.7	78.1	72.8	5.3	76.8	0.1
Time since last worked at enrollment				†††		
Working at enrollment	26.9	28.8	21.4	7.4	27.6	0.8
Last worked less than one week before	14.2	14.4	13.4	1.0	14.3	0.1
Last worked one to four weeks before	25.2	25.4	24.6	0.8	25.1	-0.0
Last worked one to three months before	23.1	22.2	25.6	-3.4	22.8	-0.3
Last worked more than three months before	10.7	9.2	15.0	-5.8	10.1	-0.6
Hours per week usually worked before injury or illness	37.9	38.1	37.6	0.5	37.9	-0.0
Tenure at most recent job				†††		
Fewer than six months	20.9	19.7	24.2	-4.5	19.8	-1.1
Six months to one year	13.7	13.2	15.1	-1.9	13.2	-0.5
One to two years	14.9	14.4	16.1	-1.7	14.5	-0.4
Two to five years	18.2	18.4	17.8	0.5	18.2	0.0
More than five years	32.3	34.2	26.7	7.5	34.2	2.0
Occupational classification of pre-injury or pre-illness job				†††		
Management, professional, or related	36.7	38.1	32.7	5.4	38.2	1.5
Service	31.9	30.8	35.1	-4.3	30.9	-1.0
Sales and office	7.8	8.3	6.5	1.8	8.5	0.7
Natural resources, construction, or maintenance	9.3	8.8	10.9	-2.1	8.5	-0.8
Production, transportation, or material moving	14.3	14.0	14.8	-0.8	13.9	-0.3

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between all enrollees and weighted respondents (F)
Missing	0.0	0.0	0.0	0.0	0.0	0.0
Economic well-being						
Earnings in the quarter before the enrollment quarter ($)	10,387	10,858	9,052	1,806***	10,580	193
Earned $1,000 or more in one of the past 12 months	80.9	81.8	78.3	3.5**	81.5	0.6
Receipt of income other than earnings						
Social Security disability (SSDI or SSI)	s	s	0.0	s	s	0.0
Veteran's benefits	1.0	0.9	1.1	-0.1	0.9	-0.1
Workers' compensation	1.0	1.1	0.7	0.4	1.1	0.1
Employer-provided or other private disability insurance	2.4	2.3	2.7	-0.4	2.3	-0.2
Other public programs	12.2	12.2	12.3	-0.2	12.4	0.2
Applied for or received SSDI or SSI in the past three years	1.1	1.0	1.4	-0.4	0.9	-0.1
Covered by health insurance	96.0	96.6	94.2	2.4**	96.6	0.6
Total number of enrollees	**3,199**	**2,365**	**834**		**2,365**	

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: In column D, we compared the baseline characteristics of respondents (column B) to enrollees who did not respond to the one-year follow-up survey (column C). For continuous or binary variables, we conducted a two-tailed t-test, and for multinomial categorical variables, we conducted an F-test of joint significance across all categories. In column E, we show the baseline characteristics of weighted survey respondents. In column F, we compared the baseline characteristics of all enrollees (column A) to weighted survey respondents (column E). For each mean or proportion, we assessed whether the effect size of the difference, in absolute value, was greater than 0.05.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/†† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

‡ = Absolute value of the effect size is greater than 0.05

Exhibit A.7. OH RETAIN: Baseline characteristics of all enrollees, survey respondents, and survey nonrespondents (percentage unless otherwise noted)

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Demographic characteristics						
Sex						
Female	62.0	64.3	58.4	5.9***	64.0	2.0
Age				†††		
18–29	14.2	11.2	18.8	-7.6	13.2	-1.0
30–39	20.2	18.7	22.4	-3.8	20.1	-0.1
40–44	12.5	12.2	13.0	-0.9	11.9	-0.6
45–49	13.0	13.9	11.6	2.2	14.3	1.3
50–54	15.0	15.7	13.8	1.9	14.6	-0.4
55–59	14.4	16.0	12.0	4.0	14.5	0.0
60 and older	10.7	12.3	8.2	4.1	11.4	0.7
Average (years)	44.5	45.8	42.5	3.3***	44.8	0.3
Race and ethnicity						
Hispanic	4.2	4.2	4.3	-0.2	3.9	-0.3
White, non-Hispanic	76.3	77.5	74.4	3.1	76.8	0.6
Black, non-Hispanic	17.1	16.2	18.5	-2.3	17.2	0.1
Asian, non-Hispanic	0.5	0.4	0.7	-0.4	0.3	-0.2
More than one race	1.5	1.4	1.6	-0.2	1.5	0.0
Other, non-Hispanic	0.3	0.3	s	-0.1	0.2	-0.1
Missing	0.1	0.1	s	0.0	0.1	-0.0
Preferred language						
English	99.6	99.6	99.6	0.1	99.7	0.1
Spanish	0.3	s	s	-0.1	s	-0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Other	0.1	s	s	0.0	s	-0.0
Education				†††		
Less than a high school diploma	4.1	3.4	5.1	-1.7	3.3	-0.8
High school diploma, GED, or certificate of completion	38.7	38.0	39.7	-1.6	37.4	-1.3
Occupational certificate, license, or two-year college degree	32.8	31.7	34.5	-2.8	32.0	-0.8
Four-year college or postgraduate degree	24.4	26.9	20.7	6.2	27.3	2.9‡
Injury or Illness characteristics						
Type of injury or illness				††		
Musculoskeletal, back	9.4	9.5	9.2	0.3	9.7	0.3
Musculoskeletal, non-back	71.2	71.5	70.8	0.7	71.3	0.1
Mental	1.2	0.8	1.7	-0.9	0.9	-0.3
Other	18.2	18.2	18.3	-0.1	18.2	-0.1
Missing	0.0	0.0	0.0	0.0	0.0	0.0
New injury or illness	47.9	47.0	49.4	-2.4	47.2	-0.7
Injury or result of an accident	58.5	56.3	61.7	-5.4***	57.8	-0.7
Work-related injury or illness	3.9	3.8	4.1	-0.3	4.1	0.2
Injury or illness as part of a workers' compensation claim	0.0	0.0	0.0	0.0	0.0	0.0
Time between injury or illness and enrollment						
Total days	20	21	19	2***	20	-0
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	0.0	0.0
Missing	0.0	0.0	0.0	0.0	0.0	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Recent work history						
Employment status at enrollment						
Not employed	12.2	11.7	13.0	-1.4	12.1	-0.1
Self-employed	2.7	2.7	2.8	-0.1	3.0	0.2
Employed	85.1	85.7	84.2	1.5	84.9	-0.1
Time since last worked at enrollment				†		
Working at enrollment	27.5	28.9	25.4	3.5	27.8	0.3
Last worked less than one week before	16.6	16.5	16.6	-0.1	15.9	-0.7
Last worked one to four weeks before	35.0	33.5	37.1	-3.6	35.9	0.9
Last worked one to three months before	10.9	11.2	10.5	0.7	10.3	-0.6
Last worked more than three months before	10.0	9.8	10.3	-0.5	10.1	0.1
Hours per week usually worked before injury or illness	38.8	38.9	38.6	0.3	38.7	-0.1
Tenure at most recent job						
Fewer than six months	15.7	14.9	16.8	-1.8	15.3	-0.4
Six months to one year	11.6	11.9	11.3	0.7	12.0	0.4
One to two years	13.3	12.7	14.1	-1.3	12.8	-0.5
Two to five years	18.2	18.6	17.5	1.1	18.7	0.5
More than five years	41.2	41.8	40.4	1.4	41.2	-0.0
Occupational classification of pre-injury or pre-illness job						
Management, professional, or related	28.6	28.8	28.4	0.4	29.7	1.0
Service	39.1	38.6	39.7	-1.1	40.0	0.9
Sales and office	8.8	9.2	8.2	1.1	8.8	0.0
Natural resources, construction, or maintenance	5.4	5.1	5.7	-0.6	4.9	-0.5
Production, transportation, or material moving	18.1	18.2	17.9	0.3	16.7	-1.4

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Missing	0.0	0.0	0.0	0.0	0.0	0.0
Economic well-being						
Earnings in the quarter before the enrollment quarter ($)	10,520	10,639	10,343	297	10,533	12
Earned $1,000 or more in one of the past 12 months	82.3	82.4	82.2	0.2	82.7	0.4
Receipt of income other than earnings						
Social Security disability (SSDI or SSI)	0.2	0.1	0.3	-0.1	0.1	-0.0
Veteran's benefits	0.9	1.0	0.8	0.2	1.3	0.4
Workers' compensation	0.0	s	0.0	0.1	s	0.0
Employer-provided or other private disability insurance	25.2	26.5	23.4	3.1**	25.9	0.7
Other public programs	0.3	0.3	0.3	0.0	0.2	-0.1
Applied for or received SSDI or SSI in the past three years	0.8	1.0	0.5	0.6**	1.2	0.4
Covered by health insurance	97.3	97.5	97.1	0.3	97.7	0.3
Total number of enrollees	**4,525**	**2,711**	**1,814**		**2,711**	

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: In column D, we compared the baseline characteristics of respondents (column B) to enrollees who did not respond to the one-year follow-up survey (column C). For continuous or binary variables, we conducted a two-tailed t-test, and for multinomial categorical variables, we conducted an F-test of joint significance across all categories. In column E, we show the baseline characteristics of weighted survey respondents. In column F, we compared the baseline characteristics of all enrollees (column A) to weighted survey respondents (column E). For each mean or proportion, we assessed whether the effect size of the difference, in absolute value, was greater than 0.05.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

‡ = Absolute value of the effect size is greater than 0.05

Exhibit A.8. VT RETAIN: Baseline characteristics of all enrollees, survey respondents, and survey nonrespondents (percentage unless otherwise noted)

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Demographic characteristics						
Sex						
Female	64.0	65.6	58.8	6.8*	65.5	1.4
Age				†††		
18–29	19.0	14.8	33.0	-18.3	16.9	-2.1‡
30–39	24.4	24.3	24.8	-0.5	24.0	-0.4
40–44	13.5	14.3	11.1	3.1	13.9	0.3
45–49	11.2	11.8	9.1	2.7	11.6	0.4
50–54	10.0	10.2	9.6	0.6	10.0	-0.0
55–59	9.6	10.6	6.7	3.9	10.5	0.8
60 and older	12.2	14.1	5.7	8.4	13.1	1.0
Average (years)	42.7	44.1	38.0	6.1***	43.5	0.8‡
Race and ethnicity						
Hispanic	3.5	3.6	3.1	0.5	3.6	0.1
White, non-Hispanic	88.2	88.6	87.0	1.5	88.5	0.3
Black, non-Hispanic	1.4	1.3	1.7	-0.5	1.3	-0.1
Asian, non-Hispanic	0.9	1.0	s	0.3	1.0	0.1
More than one race	2.9	3.0	2.6	0.3	2.9	0.0
Other, non-Hispanic	0.5	0.5	s	-0.1	0.5	-0.0
Missing	2.6	2.1	4.3	-2.2	2.1	-0.5
Preferred language						
English	99.7	99.8	99.4	0.4	99.8	0.1
Spanish	s	s	s	s	s	0.0

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Other	s	s	s	s	s	-0.1
Education				†††		
Less than a high school diploma	3.6	3.0	5.8	-2.8	2.9	-0.7
High school diploma, GED, or certificate of completion	33.5	28.6	49.4	-20.8	29.3	-4.2‡
Occupational certificate, license, or two-year college degree	17.8	19.1	13.4	5.7	18.8	1.0
Four-year college or postgraduate degree	45.1	49.3	31.4	17.9	49.0	3.9‡
Injury or Illness characteristics						
Type of injury or illness						
Musculoskeletal, back	9.4	10.1	7.1	2.9	9.7	0.3
Musculoskeletal, non-back	21.9	23.3	17.5	5.8	22.7	0.7
Mental	41.5	40.1	46.1	-6.0	41.0	-0.5
Other	24.8	24.6	25.4	-0.8	24.6	-0.2
Missing	2.4	1.9	3.8	-1.9	2.0	-0.4
New injury or illness	18.4	16.8	23.5	-6.7*	16.6	-1.7
Injury or result of an accident	19.2	20.3	15.5	4.8	19.8	0.6
Work-related injury or illness	23.2	24.6	18.7	5.9**	24.3	1.0
Injury or illness as part of a workers' compensation claim	5.7	5.7	5.8	-0.1	5.6	-0.2
Time between injury or illness and enrollment						
Total days	156	154	161	-7	153	-2
Enrolled before onset of injury or illness	0.8	1.0	0.0	1.0***	1.0	0.3
Missing	1.9	1.4	3.3	-1.9	1.5	-0.4

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Recent work history						
Employment status at enrollment				†		
Not employed	24.4	23.5	27.4	-3.8	23.7	-0.7
Self-employed	10.3	11.4	6.7	4.7	10.9	0.6
Employed	65.3	65.1	66.0	-0.9	65.4	0.1
Time since last worked at enrollment						
Working at enrollment	39.1	40.8	33.6	7.2	40.2	1.1
Last worked less than one week before	24.2	23.1	27.6	-4.5	23.5	-0.7
Last worked one to four weeks before	10.5	9.7	13.4	-3.7	10.1	-0.5
Last worked one to three months before	11.9	11.2	14.3	-3.2	11.4	-0.5
Last worked more than three months before	14.3	15.3	11.1	4.2	14.9	0.6
Hours per week usually worked before injury or illness	38.4	38.2	39.2	-1.0	38.1	-0.3
Tenure at most recent job				†††		
Fewer than six months	26.7	24.9	32.5	-7.6	25.8	-0.9
Six months to one year	14.9	14.2	17.2	-3.0	14.2	-0.7
One to two years	16.3	15.7	18.2	-2.4	15.9	-0.4
Two to five years	17.0	17.8	14.5	3.3	17.8	0.7
More than five years	25.1	27.3	17.6	9.8	26.3	1.2
Occupational classification of pre-injury or pre-illness job						
Management, professional, or related	43.5	46.2	34.5	11.8	45.6	2.1
Service	29.4	28.0	34.1	-6.1	28.4	-1.0
Sales and office	9.5	9.5	9.6	-0.2	9.6	0.1
Natural resources, construction, or maintenance	7.8	7.5	8.6	-1.0	7.6	-0.1
Production, transportation, or material moving	7.9	7.3	9.9	-2.6	7.3	-0.6

Variable	All enrollees (A)	Respondents (B)	Non-respondents (C)	Difference between respondents and nonrespondents (D)	Weighted respondents (E)	Difference between weighted respondents and all enrollees (F)
Missing	1.9	1.4	3.3	-1.9	1.5	-0.4
Economic well-being						
Earnings in the quarter before the enrollment quarter ($)	6,986	7,049	6,780	269	7,027	41
Earned $1,000 or more in one of the past 12 months	76.9	77.8	74.2	3.6	78.0	1.0
Receipt of income other than earnings						
Social Security disability (SSDI or SSI)	0.5	0.6	0.1	0.6*	0.6	0.1
Veteran's benefits	1.6	1.9	s	1.2***	1.9	0.3
Workers' compensation	2.4	2.4	2.2	0.2	2.4	-0.0
Employer-provided or other private disability insurance	2.4	2.8	s	1.8*	2.7	0.3
Other public programs	11.7	10.6	15.3	-4.7	10.6	-1.1
Applied for or received SSDI or SSI in the past three years	6.5	7.0	5.0	2.0	7.0	0.5
Covered by health insurance	96.1	96.2	95.7	0.5	96.2	0.1
Total number of enrollees	**798**	**612**	**186**		**612**	

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: In column D, we compared the baseline characteristics of respondents (column B) to enrollees who did not respond to the one-year follow-up survey (column C). For continuous or binary variables, we conducted a two-tailed t-test, and for multinomial categorical variables, we conducted an F-test of joint significance across all categories. In column E, we show the baseline characteristics of weighted survey respondents. In column F, we compared the baseline characteristics of all enrollees (column A) to weighted survey respondents (column E). For each mean or proportion, we assessed whether the effect size of the difference, in absolute value, was greater than 0.05.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

‡ = Absolute value of the effect size is greater than 0.05

B. Sample size and composition

1. Sample size

For the RETAIN evaluation, we defined the research sample for each program as the enrollees assigned to either the treatment or control group through random assignment of either individuals or primary care practices, depending on the program (Exhibit A.9). For each program, all enrollees belonged to the research sample, except a small number who (1) were enrolled in error, (2) experienced contamination, (3) chose to withdraw from the evaluation, or (4) were wildcard enrollees who did not undergo random assignment.[8]

Only research sample members were eligible for the one-year follow-up survey that provided crucial outcomes data for the final impact analysis. For each program, the analysis sample for the one-year evaluation comprised the full research sample for outcomes based on administrative data and one-year survey respondents for outcomes based on survey data (Exhibit A.9).

Exhibit A.9. RETAIN sample sizes, by program

Random assignment group	RETAINWOR*KS*	RETAIN KY	MN RETAIN	OH RETAIN	VT RETAIN
Research sample (randomly assigned enrollees)					
Treatment	509	1,654	1,598	2,264	450
Control	454	1,499	1,601	2,261	348
Total	963	3,153	3,199	4,525	798
Sample eligible for the one-year follow-up survey					
Treatment	507	1,641	1,589	1,741	450
Control	453	1,493	1,586	1,758	348
Total	960	3,134	3,175	3,499	798
Analysis sample (one-year follow-up survey respondents)					
Treatment	387	1,195	1,195	1,369	343
Control	345	1,092	1,170	1,342	269
Total	732	2,287	2,365	2,711	612

Source: RETAIN enrollment data and one-year follow-up survey.

Note: The research sample comprises all enrollees who were randomly assigned except enrollees who were enrolled in error (n = 6), experienced contamination (n = 5), or chose to withdraw from the evaluation (n = 1). It excludes wildcard enrollees who did not undergo random assignment (n = 3). The sample eligible for the one-year follow-up survey comprises all research sample members except those who chose to withdraw from the survey but remain in the evaluation (n = 3), died during the fielding of the one-year survey (n = 53), or were OH RETAIN enrollees who were not sampled for the survey (n = 1,016). The analysis sample comprises the sample of people eligible for the one-year follow-up survey who responded to the survey.

[8] In September 2023, DOL granted OH RETAIN permission to bypass random assignment for up to three enrollees (wildcards) per month with behavioral health conditions. We automatically assigned these wildcard enrollees to the treatment group of the OH RETAIN program. We excluded these cases from the evaluation because they were not randomly assigned.

2. Baseline characteristics

We expected enrollees in the treatment and control groups of each RETAIN program to be similar in their initial characteristics because of the experimental study design we used to construct the groups. Random assignment, when implemented correctly, should result in research groups that are, on average, similar in their characteristics at the time of enrollment. For each program, we checked that random assignment worked as expected by comparing the baseline characteristics of treatment and control group members in the research sample (all enrollees) and analysis sample (one-year follow-up survey respondents). We examined 29 measures covering 20 types of characteristics (for example, we examined both a continuous and categorical measure of enrollee age).

In Exhibits A.10.1–A.13.2, we present the results of baseline balance tests for the four programs that used individual random assignment designs: RETAINWOR*KS*, RETAIN KY, MN RETAIN, and OH RETAIN. The results of the tests indicate that random assignment worked as intended in each RETAIN program. For each program, we found only a small number of differences in baseline characteristics among all enrollees and among early follow-up survey respondents. For each program and sample, though some individual characteristics may have shown statistically significant differences, they were likely to be due to chance. With a significance level of 10 percent, we expect to reject the null hypothesis that the groups were equivalent for one out of every 10 characteristics by chance alone, even when the two groups in fact had no underlying differences. Therefore, we consider significant differences for three or fewer measures out of the 29 measures as not concerning. Furthermore, as we describe in Appendix B, we included characteristics that were significantly different at baseline as covariates in the regression-adjusted impact analyses to control for the observed differences.

Exhibits A.14.1 and A.14.2 present the results of baseline balance tests for VT RETAIN, the program that used clustered random assignment design. Notably, the sizes of the treatment and control group are uneven. Although we stratified random assignment of primary care practices based on their approximate size, practices might have varied in the number of potentially eligible patients they received or the extent to which they supported recruitment, which could have contributed to differences in the sizes of treatment and control groups. As with the other programs, VT RETAIN's treatment and control groups were similar in baseline characteristics. We observed three notable differences in enrollee characteristics among enrollees—a slightly larger number than we did in the other programs.[9] This pattern might be expected due to the clustered random assignment of primary care practices. Because people who seek care at the same primary care practice might have similar characteristics, and we assigned all enrollees associated with a practice the same random assignment status, differences in the treatment and control groups are more likely to appear when random assignment occurred at the practice level than the individual level. Nonetheless, we observed only three statistically significant differences in enrollee characteristics—close to the number of differences we might detect through chance alone with a significance level of 10 percent.

[9] For a fourth characteristic, preferred language, the difference was statistically significant but trivial in magnitude. All control enrollees reported English was their preferred language, while this share was 99.6 percent among control enrollees.

Exhibit A.10.1. RETAINWORK*S*: Baseline characteristics of all enrollees, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	61.5	60.4	62.7	-2.3	0.46
Age[a]					**0.68**
18–29	16.6	16.6	16.7	-0.1	
30–39	22.8	23.9	21.7	2.2	
40–44	13.4	12.7	14.1	-1.4	
45–49	13.3	13.7	12.8	0.9	
50–54	12.7	12.9	12.4	0.5	
55–59	11.1	11.7	10.5	1.1	
60 and older	10.1	8.5	11.8	-3.3	
Average (years)	43.1	42.9	43.3	-0.4	0.62
Race and ethnicity					**0.36**
Hispanic	9.3	8.9	9.8	-0.9	
White, non-Hispanic	72.0	69.8	74.4	-4.6	
Black, non-Hispanic	12.4	14.0	10.5	3.5	
Asian, non-Hispanic	0.7	s	s	0.1	
More than one race	3.1	4.0	2.2	1.8	
Other, non-Hispanic	2.2	2.2	2.2	0.0	
Missing	0.3	s	s	0.2	
Preferred language					**0.78**
English	99.3	99.2	99.4	-0.2	
Spanish	0.7	0.8	0.6	0.2	
Other	0.0	0.0	0.0	0.0	
Education					**0.45**
Less than a high school diploma	5.1	5.1	5.1	0.0	
High school diploma, GED, or certificate of completion	45.6	47.6	43.4	4.2	
Occupational certificate, license, or two-year college degree	29.7	29.4	30.0	-0.6	
Four-year college or postgraduate degree	19.6	17.9	21.5	-3.6	
Injury or illness characteristics					
Type of illness					**0.70**
Musculoskeletal, back	17.1	17.0	17.3	-0.3	
Musculoskeletal, non-back	49.3	47.8	51.0	-3.2	
Mental	7.4	7.8	s	0.9	
Other	25.4	26.5	24.3	2.2	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.7	0.9	s	0.4	
New injury or illness	46.9	47.9	45.8	2.1	0.49
Injury or result of an accident	47.9	45.9	50.1	-4.2	0.18
Work-related injury or illness	29.5	27.5	31.7	-4.2	0.14
Injury or illness as part of a workers' compensation claim	17.9	16.3	19.6	-3.3	0.17
Time between injury or illness and enrollment					
Total days	39	38	39	-1	0.53
Enrolled before onset of injury or illness	s	s	0.0	s	s
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.98**
Not employed	19.2	19.0	19.5	-0.5	
Self-employed	4.3	4.3	4.2	0.1	
Employed	76.5	76.7	76.3	0.4	
Time since last worked at enrollment[a]					**0.69**
Working at enrollment	35.8	37.3	34.2	3.0	
Last worked less than one week before	16.2	15.0	17.5	-2.5	
Last worked one to four weeks before	17.0	17.8	16.2	1.6	
Last worked one to three months before	15.3	14.9	15.7	-0.7	
Last worked more than three months before	15.7	15.0	16.4	-1.3	
Hours per week usually worked before injury or illness	40.6	40.0	41.3	-1.3**	0.04
Tenure at most recent job					**0.97**
Less than six months	23.1	22.6	23.5	-0.9	
Six months to one year	12.8	13.3	12.2	1.1	
One to two years	17.7	17.7	17.6	0.1	
Two to five years	19.4	18.9	20.0	-1.1	
More than five years	27.1	27.5	26.7	0.8	
Occupational classification of pre-injury or pre-illness job				†	**0.10**
Management, professional, or related	28.1	26.1	30.4	-4.3	
Service	35.4	35.4	35.4	0.0	
Sales and office	9.2	8.6	10.0	-1.4	
Natural resources, construction, or maintenance	8.0	9.7	6.1	3.5	
Production, transportation, or material moving	19.2	20.2	18.1	2.1	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	7,977	7,946	8,012	-65	0.88
Earned $1,000 or more in one of the past 12 months	80.2	79.4	81.1	-1.7	0.47
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	s	0.0	s	s	s
Veteran's benefits	2.0	2.2	1.7	0.4	0.62
Workers' compensation	5.4	5.5	5.2	0.3	0.84
Employer-provided or other private disability insurance	7.6	7.0	8.3	-1.3	0.43
Other public programs	2.9	2.4	3.5	-1.1	0.31
Applied for or received SSDI or SSI in the past three years	5.2	4.1	6.4	-2.3	0.11
Covered by health insurance	86.9	89.4	84.2	5.2**	0.02
Total number of enrollees	**963**	**509**	**454**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.10.2. RETAINWORK*S*: Baseline characteristics of one-year follow-up survey respondents, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	63.7	61.6	66.1	-4.6	0.20
Age[a]					**0.92**
18–29	15.1	14.8	15.4	-0.6	
30–39	21.6	21.8	21.3	0.6	
40–44	13.9	13.8	14.1	-0.4	
45–49	13.4	14.1	12.6	1.5	
50–54	13.3	13.6	13.0	0.6	
55–59	11.7	12.2	11.1	1.1	
60 and older	11.0	9.7	12.5	-2.8	
Average (years)	43.9	43.9	43.9	0.0	0.96
Race and ethnicity					**0.78**
Hispanic	10.1	9.5	10.8	-1.3	
White, non-Hispanic	71.8	70.4	73.3	-2.8	
Black, non-Hispanic	11.8	13.0	10.5	2.4	
Asian, non-Hispanic	s	s	s	s	
More than one race	3.2	3.8	2.7	1.1	
Other, non-Hispanic	2.3	2.3	2.2	0.1	
Missing	s	s	s	s	
Preferred language					**0.97**
English	99.0	99.0	99.1	0.0	
Spanish	1.0	1.0	0.9	0.0	
Other	0.0	0.0	0.0	0.0	
Education					**0.46**
Less than a high school diploma	5.1	4.7	5.5	-0.9	
High school diploma, GED, or certificate of completion	43.8	46.4	40.8	5.7	
Occupational certificate, license, or two-year college degree	29.5	28.7	30.5	-1.8	
Four-year college or postgraduate degree	21.6	20.2	23.2	-3.0	
Injury or illness characteristics					
Type of illness					**0.43**
Musculoskeletal, back	17.5	18.4	16.4	2.0	
Musculoskeletal, non-back	50.2	47.1	53.6	-6.5	
Mental	6.3	6.1	s	-0.4	
Other	25.3	27.7	22.7	5.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.7	0.7	s	-0.1	
New injury or illness	45.6	46.2	44.9	1.3	0.72
Injury or result of an accident	46.0	43.9	48.5	-4.6	0.20
Work-related injury or illness	29.5	27.5	31.7	-4.2	0.20
Injury or illness as part of a workers' compensation claim	17.3	15.4	19.4	-4.0	0.15
Time between injury or illness and enrollment					
Total days	40	38	41	-2	0.31
Enrolled before onset of injury or illness	s	s	0.0	s	s
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.84**
Not employed	19.2	20.0	18.3	1.8	
Self-employed	3.8	3.8	3.9	-0.1	
Employed	77.0	76.2	77.9	-1.7	
Time since last worked at enrollment[a]					**0.70**
Working at enrollment	37.0	36.9	37.0	0.0	
Last worked less than one week before	16.1	14.6	17.7	-3.1	
Last worked one to four weeks before	16.1	17.6	14.5	3.0	
Last worked one to three months before	14.8	14.4	15.2	-0.8	
Last worked more than three months before	16.0	16.4	15.6	0.9	
Hours per week usually worked before injury or illness	40.6	40.1	41.2	-1.2	0.15
Tenure at most recent job					**0.81**
Less than six months	20.6	18.9	22.5	-3.6	
Six months to one year	13.2	13.8	12.4	1.4	
One to two years	17.8	18.2	17.3	0.9	
Two to five years	19.5	19.6	19.4	0.2	
More than five years	29.0	29.5	28.4	1.2	
Occupational classification of pre-injury or pre-illness job				†	**0.09**
Management, professional, or related	29.6	27.8	31.6	-3.8	
Service	33.4	33.0	33.9	-0.9	
Sales and office	9.9	8.6	11.3	-2.7	
Natural resources, construction, or maintenance	7.8	9.4	6.0	3.4	
Production, transportation, or material moving	19.3	21.2	17.1	4.0	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	8,138	8,156	8,118	39	0.94
Earned $1,000 or more in one of the past 12 months	79.7	78.3	81.3	-3.0	0.28
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.0	0.0	0.0	0.0	n.a.
Veteran's benefits	1.9	2.0	1.7	0.3	0.74
Workers' compensation	5.5	5.7	5.2	0.4	0.79
Employer-provided or other private disability insurance	7.6	7.0	8.4	-1.4	0.47
Other public programs	2.9	2.4	3.6	-1.1	0.39
Applied for or received SSDI or SSI in the past three years	5.5	4.6	6.4	-1.7	0.30
Covered by health insurance	88.3	90.5	85.8	4.7*	0.05
Total number of enrollees	**732**	**387**	**345**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. We applied probability weights to account for survey nonresponse. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.11.1. RETAIN KY: Baseline characteristics of all enrollees, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	61.1	60.5	61.8	-1.2	0.48
Age[a]					**0.89**
18–29	18.1	18.1	18.1	0.0	
30–39	27.2	28.0	26.3	1.7	
40–44	14.3	13.6	15.0	-1.4	
45–49	12.3	12.1	12.4	-0.3	
50–54	11.6	11.8	11.4	0.5	
55–59	8.5	8.5	8.6	-0.1	
60 and older	8.0	7.8	8.2	-0.4	
Average (years)	41.7	41.6	41.8	-0.2	0.59
Race and ethnicity					**0.54**
Hispanic	3.2	3.7	2.7	1.0	
White, non-Hispanic	74.2	74.7	73.8	0.9	
Black, non-Hispanic	16.1	15.7	16.5	-0.9	
Asian, non-Hispanic	0.6	0.6	0.5	0.1	
More than one race	5.1	4.6	5.6	-1.0	
Other, non-Hispanic	0.3	0.4	0.3	0.0	
Missing	0.5	0.4	0.5	-0.1	
Preferred language					**0.49**
English	99.2	99.2	99.3	-0.1	
Spanish	0.2	0.3	s	0.2	
Other	0.6	0.5	s	-0.1	
Education				†	**0.08**
Less than a high school diploma	6.7	6.4	6.9	-0.5	
High school diploma, GED, or certificate of completion	48.0	49.1	46.8	2.3	
Occupational certificate, license, or two-year college degree	22.0	20.3	23.9	-3.5	
Four-year college or postgraduate degree	23.3	24.1	22.3	1.8	
Injury or illness characteristics					
Type of illness					**0.67**
Musculoskeletal, back	9.3	10.0	8.5	1.5	
Musculoskeletal, non-back	16.6	16.5	16.8	-0.3	
Mental	33.0	33.0	33.0	0.0	
Other	40.3	39.8	41.0	-1.2	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.7	0.7	0.7	0.0	
New injury or illness	18.3	18.0	18.6	-0.5	0.68
Injury or result of an accident	19.1	19.5	18.8	0.7	0.62
Work-related injury or illness	5.8	6.6	4.9	1.7**	0.04
Injury or illness as part of a workers' compensation claim	1.1	1.3	1.0	0.3	0.50
Time between injury or illness and enrollment					
Total days	45	48	41	7***	0.00
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	n.a.
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.75**
Not employed	34.8	34.4	35.3	-0.9	
Self-employed	4.6	4.4	4.7	-0.3	
Employed	60.6	61.2	60.0	1.2	
Time since last worked at enrollment[a]					**0.98**
Working at enrollment	27.5	27.4	27.7	-0.3	
Last worked less than one week before	20.5	20.5	20.4	0.1	
Last worked one to four weeks before	14.5	14.7	14.2	0.5	
Last worked one to three months before	18.1	18.3	17.9	0.3	
Last worked more than three months before	19.4	19.1	19.8	-0.7	
Hours per week usually worked before injury or illness	37.1	37.1	37.0	0.1	0.80
Tenure at most recent job					**0.95**
Less than six months	33.2	33.2	33.2	-0.1	
Six months to one year	15.6	16.1	15.1	1.0	
One to two years	13.4	13.2	13.6	-0.4	
Two to five years	16.9	16.6	17.1	-0.5	
More than five years	20.9	20.9	21.0	-0.1	
Occupational classification of pre-injury or pre-illness job					**0.24**
Management, professional, or related	27.4	28.2	26.5	1.7	
Service	39.9	39.8	40.0	-0.1	
Sales and office	8.5	7.7	9.4	-1.8	
Natural resources, construction, or maintenance	6.5	6.0	7.0	-1.0	
Production, transportation, or material moving	17.7	18.3	17.1	1.2	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	6,395	6,503	6,277	225	0.32
Earned $1,000 or more in one of the past 12 months	81.0	81.1	80.9	0.2	0.87
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.8	0.7	0.9	-0.2	0.44
Veteran's benefits	1.5	1.3	1.7	-0.4	0.36
Workers' compensation	0.1	s	s	0.0	0.90
Employer-provided or other private disability insurance	5.0	5.5	4.5	1.0	0.17
Other public programs	11.4	11.2	11.7	-0.5	0.64
Applied for or received SSDI or SSI in the past three years	2.4	2.1	2.8	-0.7	0.22
Covered by health insurance	93.0	92.5	93.5	-1.1	0.24
Total number of enrollees	**3,153**	**1,654**	**1,499**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.11.2. RETAIN KY: Baseline characteristics of one-year follow-up survey respondents, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	62.5	61.2	63.8	-2.6	0.21
Age[a]					**0.64**
18–29	16.9	16.5	17.3	-0.7	
30–39	27.1	28.2	25.9	2.3	
40–44	14.6	14.3	15.0	-0.7	
45–49	12.2	11.2	13.2	-2.0	
50–54	11.9	12.0	11.7	0.3	
55–59	9.0	9.6	8.4	1.2	
60 and older	8.3	8.2	8.5	-0.3	
Average (years)	42.1	42.1	42.1	0.1	0.89
Race and ethnicity					**0.15**
Hispanic	3.3	3.6	3.0	0.6	
White, non-Hispanic	74.8	75.4	74.0	1.4	
Black, non-Hispanic	15.8	15.8	15.7	0.1	
Asian, non-Hispanic	0.6	0.5	s	-0.2	
More than one race	4.9	4.0	5.8	-1.8	
Other, non-Hispanic	0.3	s	s	0.3	
Missing	0.4	s	0.6	-0.4	
Preferred language					**0.69**
English	99.3	99.2	99.3	0.0	
Spanish	0.3	0.3	s	0.2	
Other	0.5	0.4	s	-0.1	
Education					**0.18**
Less than a high school diploma	4.9	4.3	5.7	-1.4	
High school diploma, GED, or certificate of completion	47.4	48.5	46.2	2.3	
Occupational certificate, license, or two-year college degree	22.3	21.1	23.6	-2.6	
Four-year college or postgraduate degree	25.3	26.1	24.5	1.6	
Injury or illness characteristics					
Type of illness					**0.78**
Musculoskeletal, back	9.7	10.2	9.1	1.1	
Musculoskeletal, non-back	16.9	17.2	16.6	0.7	
Mental	31.9	31.8	32.0	-0.2	
Other	40.9	40.2	41.5	-1.3	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.7	0.6	0.8	-0.3	
New injury or illness	17.6	17.4	17.7	-0.2	0.87
Injury or result of an accident	19.4	19.4	19.3	0.1	0.95
Work-related injury or illness	6.3	7.3	5.3	2.0*	0.06
Injury or illness as part of a workers' compensation claim	1.1	1.4	0.7	0.7	0.12
Time between injury or illness and enrollment					
Total days	45	48	42	6***	0.01
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	n.a.
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.42**
Not employed	34.6	33.3	36.0	-2.7	
Self-employed	4.5	4.5	4.5	0.0	
Employed	60.9	62.2	59.5	2.6	
Time since last worked at enrollment[a]					**0.94**
Working at enrollment	28.3	28.3	28.3	0.0	
Last worked less than one week before	20.4	20.9	19.8	1.0	
Last worked one to four weeks before	14.3	14.2	14.5	-0.3	
Last worked one to three months before	17.3	17.5	17.1	0.5	
Last worked more than three months before	19.7	19.1	20.4	-1.2	
Hours per week usually worked before injury or illness	36.9	37.1	36.8	0.3	0.46
Tenure at most recent job					**0.98**
Less than six months	31.1	30.5	31.7	-1.2	
Six months to one year	16.4	16.7	16.1	0.6	
One to two years	13.3	13.4	13.1	0.3	
Two to five years	17.5	17.6	17.5	0.2	
More than five years	21.7	21.8	21.6	0.2	
Occupational classification of pre-injury or pre-illness job					**0.37**
Management, professional, or related	28.9	30.1	27.5	2.7	
Service	39.3	39.3	39.4	-0.1	
Sales and office	9.7	8.9	10.6	-1.7	
Natural resources, construction, or maintenance	5.2	4.7	5.7	-1.0	
Production, transportation, or material moving	16.9	16.9	16.8	0.1	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	6,484	6,561	6,400	161	0.54
Earned $1,000 or more in one of the past 12 months	81.2	81.3	81.0	0.2	0.88
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.9	0.8	1.0	-0.2	0.68
Veteran's benefits	1.4	1.5	1.4	0.1	0.90
Workers' compensation	0.0	s	0.0	0.1	0.32
Employer-provided or other private disability insurance	4.5	4.9	4.2	0.7	0.38
Other public programs	10.1	10.2	10.0	0.2	0.86
Applied for or received SSDI or SSI in the past three years	2.8	2.4	3.3	-0.9	0.22
Covered by health insurance	93.1	92.1	94.3	-2.2**	0.04
Total number of enrollees	**2,287**	**1,195**	**1,092**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. We applied probability weights to account for survey nonresponse. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.12.1. MN RETAIN: Baseline characteristics of all enrollees, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	55.1	55.1	55.1	0.0	0.98
Age[a]					**0.87**
18–29	17.5	17.9	17.2	0.7	
30–39	24.1	23.6	24.6	-1.0	
40–44	13.2	12.9	13.4	-0.6	
45–49	12.6	12.8	12.3	0.5	
50–54	12.8	13.1	12.5	0.6	
55–59	11.0	11.4	10.6	0.8	
60 and older	8.8	8.3	9.4	-1.0	
Average (years)	42.5	42.5	42.6	-0.1	0.79
Race and ethnicity					**0.65**
Hispanic	7.6	7.1	8.0	-0.9	
White, non-Hispanic	74.3	73.5	75.1	-1.5	
Black, non-Hispanic	9.8	10.5	9.0	1.5	
Asian, non-Hispanic	1.8	1.8	1.7	0.0	
More than one race	3.9	4.1	3.6	0.5	
Other, non-Hispanic	1.8	2.0	1.6	0.3	
Missing	0.9	1.0	0.9	0.1	
Preferred language					**0.85**
English	97.5	97.3	97.6	-0.3	
Spanish	1.1	1.1	1.0	0.1	
Other	1.5	1.6	1.4	0.2	
Education					**0.96**
Less than a high school diploma	3.6	3.7	3.5	0.2	
High school diploma, GED, or certificate of completion	38.1	38.2	37.9	0.3	
Occupational certificate, license, or two-year college degree	25.4	25.5	25.2	0.3	
Four-year college or postgraduate degree	32.9	32.5	33.3	-0.7	
Injury or illness characteristics					
Type of illness					**0.41**
Musculoskeletal, back	10.4	11.3	9.5	1.8	
Musculoskeletal, non-back	49.7	49.6	49.8	-0.2	
Mental	14.2	14.0	14.5	-0.5	
Other	25.7	25.2	26.2	-1.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.0	0.0	0.0	0.0	
New injury or illness	44.6	44.1	45.2	-1.0	0.54
Injury or result of an accident	39.5	40.2	38.8	1.4	0.41
Work-related injury or illness	14.1	13.8	14.3	-0.4	0.72
Injury or illness as part of a workers' compensation claim	5.2	5.2	5.2	-0.1	0.94
Time between injury or illness and enrollment					
Total days	41	41	41	0	0.79
Enrolled before onset of injury or illness	7.3	7.5	7.0	0.6	0.52
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.93**
Not employed	15.2	15.2	15.2	0.0	
Self-employed	8.1	7.9	8.3	-0.4	
Employed	76.7	76.9	76.5	0.4	
Time since last worked at enrollment[a]					**0.45**
Working at enrollment	26.9	27.0	26.7	0.2	
Last worked less than one week before	14.2	14.0	14.3	-0.3	
Last worked one to four weeks before	25.2	24.6	25.8	-1.2	
Last worked one to three months before	23.1	22.7	23.4	-0.7	
Last worked more than three months before	10.7	11.7	9.7	2.0	
Hours per week usually worked before injury or illness	37.9	38.0	37.9	0.2	0.67
Tenure at most recent job					**0.39**
Less than six months	20.9	21.6	20.3	1.3	
Six months to one year	13.7	13.3	14.2	-0.9	
One to two years	14.9	15.8	13.9	1.9	
Two to five years	18.2	17.6	18.8	-1.2	
More than five years	32.3	31.7	32.8	-1.1	
Occupational classification of pre-injury or pre-illness job					**0.79**
Management, professional, or related	36.7	36.3	37.1	-0.8	
Service	31.9	32.3	31.5	0.8	
Sales and office	7.8	7.4	8.3	-0.9	
Natural resources, construction, or maintenance	9.3	9.6	9.0	0.6	
Production, transportation, or material moving	14.3	14.4	14.1	0.3	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	10,387	10,303	10,471	-168	0.61
Earned $1,000 or more in one of the past 12 months	80.9	81.4	80.3	1.1	0.42
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	s	s	s	s	s
Veteran's benefits	1.0	1.1	0.9	0.2	0.57
Workers' compensation	1.0	1.1	0.9	0.3	0.45
Employer-provided or other private disability insurance	2.4	2.2	2.7	-0.5	0.36
Other public programs	12.2	11.7	12.8	-1.1	0.31
Applied for or received SSDI or SSI in the past three years	1.1	0.9	1.2	-0.4	0.31
Covered by health insurance	96.0	95.8	96.1	-0.3	0.62
Total number of enrollees	**3,199**	**1,598**	**1,601**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.12.2. MN RETAIN: Baseline characteristics of one-year follow-up survey respondents, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	57.0	57.2	56.9	0.3	0.89
Age[a]					**0.72**
18–29	16.5	16.1	16.9	-0.8	
30–39	23.2	23.3	23.0	0.3	
40–44	13.1	12.3	13.9	-1.6	
45–49	12.8	13.2	12.4	0.8	
50–54	13.4	14.0	12.9	1.1	
55–59	11.5	12.1	10.9	1.2	
60 and older	9.5	9.0	10.0	-1.0	
Average (years)	43.1	43.3	43.0	0.2	0.64
Race and ethnicity					**0.56**
Hispanic	7.5	6.9	8.1	-1.2	
White, non-Hispanic	75.5	74.8	76.2	-1.3	
Black, non-Hispanic	9.3	10.5	8.2	2.3	
Asian, non-Hispanic	1.8	1.7	1.8	0.0	
More than one race	3.7	3.6	3.7	-0.2	
Other, non-Hispanic	1.5	1.7	1.3	0.4	
Missing	0.8	0.9	0.8	0.1	
Preferred language					**0.38**
English	97.8	97.3	98.2	-0.8	
Spanish	1.1	1.3	0.9	0.4	
Other	1.1	1.3	0.9	0.5	
Education					**0.99**
Less than a high school diploma	2.7	2.8	2.5	0.2	
High school diploma, GED, or certificate of completion	35.8	35.9	35.8	0.1	
Occupational certificate, license, or two-year college degree	26.3	26.3	26.3	0.0	
Four-year college or postgraduate degree	35.2	35.0	35.4	-0.4	
Injury or illness characteristics					
Type of illness					**0.43**
Musculoskeletal, back	10.4	11.1	9.7	1.4	
Musculoskeletal, non-back	50.4	49.1	51.8	-2.7	
Mental	13.1	13.7	12.5	1.2	
Other	26.1	26.2	26.1	0.1	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.0	0.0	0.0	0.0	
New injury or illness	43.8	43.6	44.1	-0.5	0.81
Injury or result of an accident	39.4	38.6	40.1	-1.5	0.43
Work-related injury or illness	14.5	13.9	15.2	-1.4	0.35
Injury or illness as part of a workers' compensation claim	5.4	4.9	6.0	-1.1	0.24
Time between injury or illness and enrollment					
Total days	41	41	41	0	0.84
Enrolled before onset of injury or illness	8.0	8.5	7.4	1.0	0.34
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.66**
Not employed	14.9	15.0	14.9	0.1	
Self-employed	8.2	7.7	8.8	-1.0	
Employed	76.8	77.3	76.4	0.9	
Time since last worked at enrollment[a]					**0.32**
Working at enrollment	27.6	27.6	27.7	-0.1	
Last worked less than one week before	14.3	14.1	14.5	-0.5	
Last worked one to four weeks before	25.1	24.0	26.4	-2.4	
Last worked one to three months before	22.8	23.1	22.6	0.5	
Last worked more than three months before	10.1	11.3	8.9	2.5	
Hours per week usually worked before injury or illness	37.9	37.9	37.9	0.0	0.99
Tenure at most recent job					**0.28**
Less than six months	19.8	21.0	18.6	2.4	
Six months to one year	13.2	12.3	14.2	-1.9	
One to two years	14.5	15.3	13.7	1.5	
Two to five years	18.2	17.4	19.1	-1.7	
More than five years	34.2	34.1	34.4	-0.4	
Occupational classification of pre-injury or pre-illness job					**0.59**
Management, professional, or related	38.2	38.0	38.4	-0.4	
Service	30.9	31.1	30.7	0.4	
Sales and office	8.5	7.8	9.2	-1.4	
Natural resources, construction, or maintenance	8.5	9.2	7.8	1.3	
Production, transportation, or material moving	13.9	14.0	13.9	0.1	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	10,598	10,507	10,692	-185	0.62
Earned $1,000 or more in one of the past 12 months	81.5	81.1	81.9	-0.8	0.60
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	s	s	s	s	s
Veteran's benefits	0.9	1.0	0.9	0.1	0.73
Workers' compensation	1.1	1.3	1.0	0.3	0.48
Employer-provided or other private disability insurance	2.3	1.9	2.7	-0.8	0.18
Other public programs	12.3	11.9	12.7	-0.8	0.54
Applied for or received SSDI or SSI in the past three years	0.9	0.7	1.2	-0.6	0.17
Covered by health insurance	96.6	96.5	96.7	-0.1	0.87
Total number of enrollees	**2,365**	**1,195**	**1,170**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. We applied probability weights to account for survey nonresponse. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income

Exhibit A.13.1. OH RETAIN: Baseline characteristics of all enrollees, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	62.0	62.0	62.0	0.0	0.99
Age[a]					**0.18**
18–29	14.2	14.1	14.3	-0.2	
30–39	20.2	20.7	19.6	1.1	
40–44	12.5	12.6	12.5	0.1	
45–49	13.0	12.4	13.6	-1.2	
50–54	15.0	14.2	15.8	-1.6	
55–59	14.4	14.3	14.6	-0.3	
60 and older	10.7	11.7	9.6	2.1	
Average (years)	44.5	44.5	44.4	0.1	0.76
Race and ethnicity					**0.59**
Hispanic	4.2	4.2	4.3	-0.1	
White, non-Hispanic	76.3	76.5	76.1	0.4	
Black, non-Hispanic	17.1	16.8	17.4	-0.7	
Asian, non-Hispanic	0.5	0.6	0.4	0.2	
More than one race	1.5	1.4	1.6	-0.2	
Other, non-Hispanic	0.3	0.4	0.2	0.2	
Missing	0.1	0.1	0.0	0.1	
Preferred language					**0.68**
English	99.6	99.7	99.5	0.2	
Spanish	0.3	0.3	s	-0.1	
Other	0.1	0.0	s	0.0	
Education					**0.39**
Less than a high school diploma	4.1	4.1	4.2	-0.1	
High school diploma, GED, or certificate of completion	38.7	39.6	37.7	1.9	
Occupational certificate, license, or two-year college degree	32.8	31.7	33.9	-2.3	
Four-year college or postgraduate degree	24.4	24.6	24.1	0.5	
Injury or illness characteristics					
Type of illness					**0.53**
Musculoskeletal, back	9.4	9.3	9.4	-0.2	
Musculoskeletal, non-back	71.2	70.6	71.9	-1.3	
Mental	1.2	1.1	1.3	-0.2	
Other	18.2	19.0	17.4	1.6	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.0	0.0	0.0	0.0	
New injury or illness	47.9	48.0	47.9	0.1	0.96
Injury or result of an accident	58.5	58.6	58.3	0.4	0.79
Work-related injury or illness	3.9	3.7	4.1	-0.4	0.50
Injury or illness as part of a workers' compensation claim	0.0	0.0	0.0	0.0	n.a.
Time between injury or illness and enrollment					
Total days	20	20	21	-1***	0.01
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	n.a.
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.59**
Not employed	12.2	12.3	12.2	0.1	
Self-employed	2.7	3.0	2.5	0.5	
Employed	85.1	84.8	85.4	-0.6	
Time since last worked at enrollment[a]					**0.74**
Working at enrollment	27.5	28.0	26.9	1.1	
Last worked less than one week before	16.6	16.0	17.1	-1.1	
Last worked one to four weeks before	35.0	35.3	34.6	0.7	
Last worked one to three months before	10.9	10.9	11.0	-0.1	
Last worked more than three months before	10.0	9.7	10.3	-0.6	
Hours per week usually worked before injury or illness	38.8	38.8	38.7	0.1	0.66
Tenure at most recent job					**0.70**
Less than six months	15.7	15.0	16.3	-1.3	
Six months to one year	11.6	11.7	11.6	0.1	
One to two years	13.3	13.3	13.2	0.1	
Two to five years	18.2	18.7	17.6	1.2	
More than five years	41.2	41.2	41.3	-0.1	
Occupational classification of pre-injury or pre-illness job					**0.12**
Management, professional, or related	28.6	27.1	30.2	-3.0	
Service	39.1	40.3	37.9	2.4	
Sales and office	8.8	9.1	8.6	0.5	
Natural resources, construction, or maintenance	5.4	5.0	5.7	-0.7	
Production, transportation, or material moving	18.1	18.5	17.7	0.8	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	10,520	10,429	10,612	-183	0.46
Earned $1,000 or more in one of the past 12 months	82.3	82.3	82.3	0.0	0.99
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.2	0.2	0.2	0.0	0.80
Veteran's benefits	0.9	0.9	0.9	-0.1	0.84
Workers' compensation	0.0	0.0	0.0	0.0	1.00
Employer-provided or other private disability insurance	25.2	25.4	25.0	0.4	0.72
Other public programs	0.3	0.4	0.3	0.1	0.59
Applied for or received SSDI or SSI in the past three years	0.8	0.5	1.1	-0.6**	0.03
Covered by health insurance	97.3	97.5	97.2	0.3	0.56
Total number of enrollees	**4,525**	**2,264**	**2,261**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.13.2. OH RETAIN: Baseline characteristics of one-year follow-up survey respondents, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex[a]					
Female	64.0	62.9	65.1	-2.2	0.31
Age[a]				†	**0.06**
18–29	13.2	12.8	13.7	-0.9	
30–39	20.1	21.8	18.4	3.4	
40–44	11.9	11.6	12.1	-0.5	
45–49	14.3	13.2	15.4	-2.2	
50–54	14.6	13.7	15.6	-1.9	
55–59	14.5	13.9	15.1	-1.2	
60 and older	11.4	13.0	9.7	3.4	
Average (years)	44.8	44.9	44.8	0.1	0.88
Race and ethnicity					**0.34**
Hispanic	3.9	4.0	3.9	0.1	
White, non-Hispanic	76.8	77.8	75.9	1.9	
Black, non-Hispanic	17.2	16.3	18.1	-1.8	
Asian, non-Hispanic	0.3	0.4	s	0.3	
More than one race	1.5	1.2	1.8	-0.7	
Other, non-Hispanic	0.2	s	0.2	0.1	
Missing	0.1	s	s	0.1	
Preferred language				†††	**0.00**
English	99.7	99.8	99.5	0.3	
Spanish	s	0.2	s	s	
Other	s	0.0	s	s	
Education					**0.18**
Less than a high school diploma	3.3	3.3	3.3	-0.1	
High school diploma, GED, or certificate of completion	37.4	39.6	35.2	4.5	
Occupational certificate, license, or two-year college degree	32.0	30.3	33.8	-3.5	
Four-year college or postgraduate degree	27.3	26.8	27.7	-0.9	
Injury or illness characteristics					
Type of illness					**0.11**
Musculoskeletal, back	9.7	8.9	10.5	-1.6	
Musculoskeletal, non-back	71.3	72.5	70.1	2.4	
Mental	0.9	0.5	1.2	-0.7	
Other	18.2	18.1	18.2	-0.1	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	0.0	0.0	0.0	0.0	
New injury or illness	47.2	47.3	47.1	0.2	0.92
Injury or result of an accident	57.8	57.8	57.7	0.1	0.97
Work-related injury or illness	4.1	3.5	4.8	-1.2	0.24
Injury or illness as part of a workers' compensation claim	0.0	0.0	0.0	0.0	n.a.
Time between injury or illness and enrollment					
Total days	20	19	21	-2***	0.00
Enrolled before onset of injury or illness	0.0	0.0	0.0	0.0	n.a.
Missing	0.0	0.0	0.0	0.0	n.a.
Recent work history					
Employment status at enrollment[a]					**0.85**
Not employed	12.1	12.1	12.1	-0.1	
Self-employed	3.0	2.7	3.2	-0.4	
Employed	84.9	85.2	84.7	0.5	
Time since last worked at enrollment[a]					**0.74**
Working at enrollment	27.8	28.5	27.2	1.3	
Last worked less than one week before	15.9	16.0	15.8	0.2	
Last worked one to four weeks before	35.9	36.2	35.6	0.6	
Last worked one to three months before	10.3	10.2	10.5	-0.3	
Last worked more than three months before	10.1	9.2	11.0	-1.9	
Hours per week usually worked before injury or illness	38.7	38.8	38.6	0.2	0.72
Tenure at most recent job					**0.47**
Less than six months	15.3	14.3	16.3	-2.0	
Six months to one year	12.0	12.2	11.8	0.4	
One to two years	12.8	12.3	13.3	-1.0	
Two to five years	18.7	20.0	17.4	2.6	
More than five years	41.2	41.2	41.2	0.0	
Occupational classification of pre-injury or pre-illness job					**0.72**
Management, professional, or related	29.6	28.6	30.7	-2.1	
Service	40.0	40.0	40.0	0.1	
Sales and office	8.8	8.8	8.9	-0.1	
Natural resources, construction, or maintenance	4.9	5.1	4.6	0.5	
Production, transportation, or material moving	16.7	17.5	15.8	1.6	
Missing	0.0	0.0	0.0	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	10,532	10,505	10,560	-55	0.89
Earned $1,000 or more in one of the past 12 months	82.7	83.7	81.7	2.0	0.21
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.1	s	s	-0.1	0.49
Veteran's benefits	1.3	1.3	1.3	0.0	0.96
Workers' compensation	s	s	s	s	s
Employer-provided or other private disability insurance	25.9	25.9	25.9	0.0	0.98
Other public programs	0.2	0.3	0.2	0.1	0.44
Applied for or received SSDI or SSI in the past three years	1.2	0.6	1.8	-1.2**	0.01
Covered by health insurance	97.7	97.7	97.6	0.1	0.93
Total number of enrollees	**2,711**	**1,369**	**1,342**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. We applied probability weights to account for survey sampling and nonresponse. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

[a] We stratified random assignment of enrollees based on this characteristic, so we expect it to be balanced between the treatment and control group by design.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

n.a. = not applicable; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security

Exhibit A.14.1. VT RETAIN: Baseline characteristics of all enrollees, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex					
Female	64.0	60.4	68.7	-8.3***	0.01
Age				†	**0.08**
18–29	19.0	21.1	16.4	4.8	
30–39	24.4	26.9	21.3	5.6	
40–44	13.5	11.9	15.6	-3.7	
45–49	11.2	11.0	11.3	-0.3	
50–54	10.0	8.8	11.7	-2.9	
55–59	9.6	9.5	9.8	-0.3	
60 and older	12.2	10.8	13.9	-3.2	
Average (years)	42.7	41.7	44.0	-2.4**	0.02
Race and ethnicity					**0.83**
Hispanic	3.5	3.5	3.5	0.0	
White, non-Hispanic	88.2	89.0	87.3	1.7	
Black, non-Hispanic	1.4	1.6	1.1	0.4	
Asian, non-Hispanic	0.9	s	0.9	0.0	
More than one race	2.9	2.6	3.2	-0.6	
Other, non-Hispanic	0.5	s	0.8	-0.5	
Missing	2.6	2.2	3.2	-1.0	
Preferred language				†††	**0.00**
English	99.7	99.6	100.0	-0.4	
Spanish	s	s	0.0	s	
Other	s	s	0.0	s	
Education					**0.33**
Less than a high school diploma	3.6	4.2	2.9	1.4	
High school diploma, GED, or certificate of completion	33.5	33.5	33.3	0.2	
Occupational certificate, license, or two-year college degree	17.8	15.6	20.7	-5.1	
Four-year college or postgraduate degree	45.1	46.6	43.1	3.5	
Injury or illness characteristics					
Type of illness					**0.80**
Musculoskeletal, back	9.4	9.3	9.6	-0.3	
Musculoskeletal, non-back	21.9	21.2	22.9	-1.6	
Mental	41.5	43.4	39.0	4.5	
Other	24.8	23.7	26.3	-2.6	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	2.4	2.4	2.4	0.0	
New injury or illness	18.4	17.7	19.3	-1.7	0.56
Injury or result of an accident	19.2	20.7	17.2	3.4	0.24
Work-related injury or illness	23.2	22.6	24.0	-1.4	0.67
Injury or illness as part of a workers' compensation claim	5.7	5.9	5.5	0.4	0.78
Time between injury or illness and enrollment					
Total days	156	156	156	0	0.99
Enrolled before onset of injury or illness	0.8	0.7	0.8	-0.1	0.80
Missing	1.9	1.8	2.0	-0.2	0.82
Recent work history					
Employment status at enrollment					**0.90**
Not employed	24.4	23.9	25.1	-1.1	
Self-employed	10.3	10.6	9.9	0.7	
Employed	65.3	65.5	65.1	0.4	
Time since last worked at enrollment				††	**0.05**
Working at enrollment	39.1	39.9	38.0	1.9	
Last worked less than one week before	24.2	21.8	27.3	-5.5	
Last worked one to four weeks before	10.5	12.9	7.5	5.3	
Last worked one to three months before	11.9	11.1	12.9	-1.8	
Last worked more than three months before	14.3	14.3	14.3	0.0	
Hours per week usually worked before injury or illness	38.4	38.3	38.7	-0.4	0.57
Tenure at most recent job					**0.44**
Less than six months	26.7	28.4	24.5	4.0	
Six months to one year	14.9	15.2	14.5	0.7	
One to two years	16.3	17.4	14.9	2.5	
Two to five years	17.0	16.4	17.9	-1.5	
More than five years	25.1	22.6	28.3	-5.7	
Occupational classification of pre-injury or pre-illness job					**0.27**
Management, professional, or related	43.5	42.4	44.9	-2.5	
Service	29.4	31.8	26.4	5.5	
Sales and office	9.5	7.7	11.9	-4.1	
Natural resources, construction, or maintenance	7.8	8.5	6.8	1.6	
Production, transportation, or material moving	7.9	7.8	8.0	-0.2	
Missing	1.9	1.8	2.0	-0.2	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	6,986	6,959	7,022	-64	0.93
Earned $1,000 or more in one of the past 12 months	76.9	77.2	76.6	0.5	0.86
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.5	0.6	s	0.3	0.55
Veteran's benefits	1.6	2.2	1.0	1.2	0.37
Workers' compensation	2.4	2.8	1.8	1.1	0.26
Employer-provided or other private disability insurance	2.4	2.0	2.9	-0.9	0.36
Other public programs	11.7	11.3	12.2	-0.9	0.76
Applied for or received SSDI or SSI in the past three years	6.5	7.0	5.9	1.1	0.49
Covered by health insurance	96.1	95.7	96.7	-1.0	0.45
Total number of enrollees	**798**	**450**	**348**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit A.14.2. VT RETAIN: Baseline characteristics of one-year follow-up survey respondents, by random assignment group (percentage unless otherwise noted)

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Demographic characteristics					
Sex					
Female	65.5	61.0	71.2	-10.2***	0.01
Age				†	**0.09**
18–29	16.9	17.9	15.6	2.3	
30–39	24.0	27.4	19.8	7.6	
40–44	13.9	12.2	16.0	-3.8	
45–49	11.6	11.4	11.9	-0.5	
50–54	10.0	9.0	11.3	-2.3	
55–59	10.5	10.9	9.9	1.1	
60 and older	13.1	11.3	15.6	-4.3	
Average (years)	43.5	42.6	44.7	-2.1*	0.05
Race and ethnicity					**0.95**
Hispanic	3.6	3.9	3.3	0.7	
White, non-Hispanic	88.5	88.1	89.0	-0.9	
Black, non-Hispanic	1.3	1.5	1.1	0.4	
Asian, non-Hispanic	1.0	s	s	-0.3	
More than one race	2.9	2.9	2.9	0.0	
Other, non-Hispanic	0.5	s	s	-0.3	
Missing	2.1	2.4	1.9	0.5	
Preferred language				†††	**0.01**
English	99.8	99.7	100.0	-0.3	
Spanish	s	s	0.0	s	
Other	s	s	0.0	s	
Education					**0.53**
Less than a high school diploma	2.9	3.3	2.5	0.7	
High school diploma, GED, or certificate of completion	29.3	28.7	30.0	-1.4	
Occupational certificate, license, or two-year college degree	18.8	16.7	21.5	-4.8	
Four-year college or postgraduate degree	49.0	51.3	45.9	5.4	
Injury or illness characteristics					
Type of illness					**0.84**
Musculoskeletal, back	9.7	9.3	10.2	-0.9	
Musculoskeletal, non-back	22.7	21.6	24.1	-2.5	
Mental	41.0	43.1	38.3	4.8	
Other	24.6	23.9	25.6	-1.7	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Missing	2.0	2.1	1.9	0.2	
New injury or illness	16.6	15.5	18.2	-2.7	0.36
Injury or result of an accident	19.8	21.1	18.1	3.0	0.33
Work-related injury or illness	24.3	23.3	25.5	-2.2	0.53
Injury or illness as part of a workers' compensation claim	5.6	5.2	6.1	-0.9	0.57
Time between injury or illness and enrollment					
Total days	153	152	156	-4	0.82
Enrolled before onset of injury or illness	1.0	1.0	1.0	-0.1	0.93
Missing	1.5	1.5	1.5	0.0	0.99
Recent work history					
Employment status at enrollment					**0.84**
Not employed	23.7	23.3	24.3	-1.0	
Self-employed	10.9	11.5	10.1	1.4	
Employed	65.4	65.2	65.6	-0.4	
Time since last worked at enrollment				†	**0.06**
Working at enrollment	40.2	40.2	40.1	0.2	
Last worked less than one week before	23.5	20.9	26.8	-5.9	
Last worked one to four weeks before	10.1	12.9	6.5	6.4	
Last worked one to three months before	11.4	10.8	12.2	-1.4	
Last worked more than three months before	14.9	15.2	14.5	0.7	
Hours per week usually worked before injury or illness	38.1	37.7	38.6	-0.8	0.30
Tenure at most recent job				††	**0.01**
Less than six months	25.8	27.6	23.6	4.0	
Six months to one year	14.2	12.6	16.4	-3.8	
One to two years	15.9	19.4	11.4	8.0	
Two to five years	17.8	17.1	18.6	-1.4	
More than five years	26.3	23.3	30.1	-6.8	
Occupational classification of pre-injury or pre-illness job				††	**0.04**
Management, professional, or related	45.6	44.3	47.2	-3.0	
Service	28.4	31.8	24.1	7.7	
Sales and office	9.6	7.2	12.8	-5.6	
Natural resources, construction, or maintenance	7.6	8.8	6.1	2.8	
Production, transportation, or material moving	7.3	6.5	8.4	-1.9	
Missing	1.5	1.5	1.5	0.0	

Variable	All (A)	Treatment group (B)	Control group (C)	Difference (B–C)	*p*-value
Economic well-being					
Earnings in the quarter before the quarter they enrolled ($)	7,028	6,793	7,327	-533	0.53
Earned $1,000 or more in one of the past 12 months	78.0	76.3	80.2	-3.9	0.30
Receipt of income other than earnings					
Social Security disability (SSDI or SSI)	0.6	0.7	s	0.3	0.61
Veteran's benefits	1.9	2.5	1.1	1.3	0.37
Workers' compensation	2.4	2.8	1.9	0.9	0.34
Employer-provided or other private disability insurance	2.7	2.3	3.3	-1.0	0.38
Other public programs	10.6	10.8	10.2	0.6	0.86
Applied for or received SSDI or SSI in the past three years	7.0	8.2	5.5	2.6	0.17
Covered by health insurance	96.2	96.3	96.1	0.2	0.90
Total number of enrollees	**612**	**343**	**269**		

Source: RETAIN enrollment data; one-year follow-up survey data.

Note: We adjusted the treatment and control group means for the characteristics based on which we stratified random assignment. We applied probability weights to account for survey nonresponse. The *p*-value for a continuous or binary variable is based on a two-tailed *t*-test. The *p*-value for a multinomial categorical variable, which we present in the row for the variable label, is based on an F-test of joint significance across all categories.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Difference in distribution is significantly different from zero (*p*-value is less than .10/.05/.01) using an F-test.

s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

C. Output and outcome measures

In the sections below, we describe the outcome measures we examined. We have organized the outcome descriptions by domain or topic area. The data sources for the measures are the program service use data, one-year follow-up survey, SSA program data, and state UI wage records. The three primary outcomes for our analysis were employment in the fourth quarter after enrollment, earnings in the four quarters after enrollment, and applications for SSDI or SSI during the 12 months after enrollment.

1. Program participation measures

For the participation analysis, we examined service use measures in five domains: (1) use of RETAIN services, (2) use of RTW coordinator services, (3) use of or referral to job retention services, (4) use of or referral to job search or training services, and (5) use of other employment-related services and supports. This section describes how we constructed the measures examined in the participation analysis, organized by domain.

a. Use of RETAIN services

We examined several summary measures of RETAIN service use among treatment enrollees.[10] We examined a binary measure of whether enrollees established a RTW plan in participation. We also examined a binary measure of whether enrollees used any RETAIN services beyond the RTW plan—that is, received one or more of the following: two or more communications between the RTW coordinator and enrollee; any services or referrals to support job retention; any services or referrals to support job search or training. We also examined a binary measure of whether enrollees used any employment services (meaning that they used or were referred to at least one job retention service, job training or job search service, or other employment service); and the average number of days between the enrollee's RETAIN enrollment and exit dates.[11]

b. Use of RTW coordinator services

We examined several measures of enrollees' use of planning and communication services provided by RTW coordinators. We analyzed a binary measure of whether enrollees established an RTW plan, which the RTW coordinator developed to support the enrollees' ability to return to or stay at work by assessing their barriers to employment and providing ways to overcome them. We also examined binary measures of whether the RTW plan was informed by a meeting between the RTW coordinator and a medical provider, employer, or another party, respectively, to clarify the enrollee's work ability, medical restrictions, functional limitations or to obtain buy-in for the RTW plan; and the average number of days between the enrollees' RETAIN enrollment and the date the RTW plan was established. In addition, we examined the binary measure of whether enrollees had at least two communications with their RTW coordinator; the mean number of communications; and the distribution in frequency of communication between the RTW coordinator and key players in the RTW process including the enrollee, employer, medical provider, or workforce professional.

[10] For the one RETAIN program that offered (limited) services to the control group, RETAIN KY, we also examined service use among control enrollees.

[11] There were differences in how the RETAIN programs recorded date of exit. For example, MN RETAIN and OH RETAIN recorded exit date as the last date of contact with the enrollee, whereas VT RETAIN recorded the exit date as six months after enrollment date for all enrollees.

c. Use of job retention services or referrals

We examined binary measures of whether enrollees used or were referred to various services to support job retention (on-site job analysis; ergonomic assessment; and RTW coordinator assisting their employer in identifying and implementing workplace accommodations) and whether they used or were referred to at least one of those services.

d. Use of job search or job training services or referrals

We examined binary measures of whether enrollees used or were referred to various types of service to support job search or job training services (job search services, job training services, and transitional work opportunity) and whether they used or were referred to at least one of those services.

e. Use of other employment services and supports

We examined binary measures of whether enrollees used or were referred to other employment services and supports separate from the services described above, including separate measures for use of such services versus referral to employment-related supports.

2. Outcome measures for impact analysis

For the impact analysis, we examined outcomes in four domains: (1) labor force attachment and employment, (2) SSA program participation, (3) economic well-being, and (4) health. This section describes how we constructed the outcomes examined in the one-year impact analysis.

We assessed impacts on three primary outcomes and a wide range of secondary outcomes. We differentiated between primary and secondary outcomes to distinguish the measures that should receive the most policy focus in the ultimate evaluation of the program's efficacy. This designation is a transparent way to avoid concerns about data mining when assessing impacts on the broad range of outcomes. The focus on a limited set of outcomes also mitigates a potential issue with multiple comparisons—that is, the chance of finding a statistically significant finding across several outcomes by chance. Based on the RETAIN theory of change, we selected three primary outcomes to test the projects' efficacy: employment in the fourth quarter after enrollment, earnings in the four quarters after enrollment, and applications for SSDI or SSI during the 12 months after enrollment. In the descriptions below, an asterisk (*) denotes the primary outcomes.

a. Labor force attachment and employment

Employment and earnings in the four quarters after enrollment

- **Employment in the first, second, and third quarter after enrollment**. These binary measures reflect whether the enrollee had positive earnings in each of the first three quarters after enrollment. We defined employment as having positive earnings in that quarter.
- **Employment in the fourth quarter after enrollment.*** This binary measure indicates whether the enrollee had positive earnings in the fourth quarter after enrollment.
- **Employment in any of the four quarters after enrollment.** This binary indicates whether the enrollee has positive earnings in any of the four quarters after enrollment.
- **Earnings in the first, second, third, and fourth quarter after enrollment.** These continuous measures capture earnings in each of the four quarters after enrollment. We used the Consumer Price Index for

Urban Wage Earners to convert average weekly earnings into constant 2024 dollars.[12] We also removed extreme outliers and winsorized the distribution of this measure.

- **Sum of earnings in Quarters 1-4 after enrollment.*** This continuous measure captures the sum of earnings across the four quarters after enrollment.
- **Earnings above SGA in the first, second, third, and fourth quarter after enrollment**. These binary measures reflect whether an enrollee earned more than the substantial gainful activity (SGA) threshold in each of the four quarters following enrollment. We compared each quarter's earnings to the corresponding year's SGA threshold, calculated by multiplying the monthly SGA level for non-blind individuals by three. For instance, we used a quarterly SGA threshold of $4,050 for 2022 and $4,410 for 2023 (SSA n.d.).

Employment at the time of the survey

- **Connected to an employer.** This binary measure indicates whether the enrollee was working at or on leave from a job at the time of the survey. We defined this connection as being employed at a job, organization, or business for pay or profit; it also included working for a business that the respondent might own.
- **Working.** This binary measure indicates whether the enrollee was working at a job at the time of the survey. It did not include enrollees who were on leave.
- **Connected to an employer or looking for work.** This binary measure indicates whether the enrollee was connected to an employer (working or on leave from a job) at the time of the survey or was not connected to an employer but had been looking for work during the two months before the survey. Looking for work includes looking for a paid full-time or part-time job. If the enrollee was not connected to an employer and had missing information about looking for work, we used multiple imputation to fill the missing information when constructing this measure.
- **Working or engaged in occasional activities or side jobs.** This binary measure indicates whether the enrollee was working at a job or engaged in occasional online or in-person work activities or side jobs (such as babysitting, yard work, selling goods online, or driving using a ride-sharing app) at the time of the survey.
- **Participated in job-related training.** We defined job-related training as having lasted at least one week and designed to help find a job, improve job skills, or learn a new job.
- **Average weekly pay.** This continuous measure shows the enrollee's average weekly pay at their main job at the time of the survey. We asked how much the enrollee typically earned before taxes or other deductions, including tips and bonuses. If the enrollee was working at a job and had missing information on average weekly pay, we used multiple imputation to fill the missing average weekly pay information when constructing this measure. We used the Consumer Price Index for Urban Wage Earners to convert average weekly earnings into constant 2024 dollars. We removed extreme outliers and winsorized the distribution of this measure.

[12] We also inflation-adjusted and winsorized earnings in the quarter before enrollment, which is a core covariate in our models.

- **Usual hours worked.** This continuous measure shows an enrollee's average hours worked per week at their main job at the time of the survey. We asked about the typical hours and provided ranges if the enrollee could not respond. If the enrollee was working at a job and had missing information on hours worked, we used multiple imputation to fill the missing work hours information when constructing this measure. We removed extreme outliers and winsorized the distribution of this measure.[13]
- **Working for an employer that offered health insurance.** This binary measure indicates whether the enrollee was working at the time of the survey and their employer offered health insurance. Enrollees had the option of selecting "Not applicable - Self-employed" in response to the survey question; in such cases, we counted them as not working for an employer that offered health insurance. If the enrollee was working at a job and had missing information on whether the employer offered health insurance, we used multiple imputation to fill in the missing information when constructing this measure.
- **Working for an employer that offered paid leave.** This binary measure indicates whether the enrollee was working at the time of the survey and their employer offered paid leave. Enrollees had the option of selecting "Not applicable - Self-employed" in response to the survey question; in such cases, we counted them as not working for an employer that offered them paid leave. If the enrollee was working at a job and had missing information on whether the employer offered paid leave, we used multiple imputation to fill in the missing information when constructing this measure.

b. SSA program participation in the 12 months after enrollment

- **Applied for SSDI or SSI.*** This binary measure indicates whether the enrollee applied for SSDI or SSI in the 12 months after enrollment.
- **Received any SSDI or SSI.** This binary measure indicates whether the enrollee received SSDI benefits or SSI payments in the 12 months after enrollment. We defined benefit or payment receipt as having SSI or SSDI benefits paid in any of the 12 months following enrollment. Since the SSI and SSDI payment variables are monthly, we defined the 12-month lookout period as beginning in the month after the month of enrollment.
- **SSA payment amount (SSDI and SSI).** This continuous measure captures the sum of SSDI benefits and SSI payments in the 12 months after enrollment. We inflation-adjusted benefit and payment amounts to 2024 dollars.
- **Applied for SSDI.** This binary measure indicates whether the enrollee applied for SSDI in the 12 months after enrollment.
- **Received any SSDI benefit.** This binary measure indicates whether the enrollee received any SSDI benefits in the 12 months after enrollment. This measure includes any SSDI benefit receipt that might be the result of an application filed before enrollment.

[13] Winsorizing involves removing or transforming extreme values in a data distribution to reduce the effect of possibly spurious outliers. We took the following steps by RETAIN program. First, we calculated the measure's 99th percentile, excluding zeroes and outlier values (values more than three times the inter-quartile range above the 75th percentile of non-zero values). We then top-coded values above the 99th percentile of the program-specific distribution of non-zero and non-outlier values at the 99th percentile of the program-specific distribution of non-zero and non-outlier values.

- **SSDI benefit amount.** This continuous measure captures the total SSDI benefit amount paid in the 12 months after enrollment**.** This measure includes any SSDI benefits that might be the result of an application filed before enrollment. We inflation-adjusted the benefit amount to 2024 dollars.
- **Received any SSI payment.** This binary measure indicates whether the enrollee received any SSDI benefits in the 12 months after enrollment. This measure includes any SSI payment receipt that might be the result of an application filed before enrollment.
- **SSI payment amount.** This continuous measure captures the total amount of SSI payments made in the 12 months after enrollment. This measure includes any SSI payments that might be the result of an application filed before enrollment. We inflation-adjusted the payment amount to 2024 dollars.

c. Economic well-being in the month before the survey

We winsorized all the continuous measures below to account for any extreme outliers and inflation-adjusted to 2024 dollars.

- **Household income.** This continuous measure captures the sum of income from Supplemental Nutrition Assistance Program (SNAP), housing assistance, SSI, SSDI, UI, workers' compensation, retirement income, private disability benefits, household earnings, and any other sources of income not queried in the survey in the month before the one-year follow-up survey.
- **Household earnings.** This continuous measure captures household earnings in the month before the one-year follow-up survey.
- **Receipt of public assistance benefits.** This binary measure indicates whether the enrollee's household received SNAP, housing assistance or unemployment compensation in the month before the one-year follow-up survey.
- **Household UI benefit amount.** This continuous measure captures the unemployment insurance benefit amount the household received in the month before the one-year follow-up survey. If the enrollee reported receipt of UI benefits and we had missing information on the amount, we used multiple imputation to fill in the missing information when constructing this measure.
- **SNAP benefit amount.** This continuous measure captures the SNAP benefit amount the household received in the month before the one-year follow-up survey. If the enrollee reported receipt of SNAP benefits and we had missing information on the amount, we used multiple imputation to fill in the missing information when constructing this measure.
- **Government housing assistance amount.** This continuous measure captures the amount of government housing assistance the household received in the month before the one-year follow-up survey. If the enrollee reported receipt of government housing assistance and we had missing information on the amount, we used multiple imputation to fill in the missing information when constructing this measure.
- **Receipt of workers' compensation benefits.** This binary measure indicates whether the household received workers' compensation benefits in the month before the one-year follow-up survey.
- **Household workers' compensation amount.** This continuous measure captures the amount of workers' compensation benefit the household received in the month before the one-year follow-up

survey. If the enrollee reported receipt of workers' compensation and we had missing information on the amount, we used multiple imputation to fill in the missing information when constructing this measure.

- **Receipt of short- or long-term disability payments.** This binary measure indicates whether the household received private short-term or long-term disability payments in the month before the one-year follow-up survey.
- **Household private disability amount.** This continuous measure captures the amount of workers' compensation benefit the household received in the month before the one-year follow-up survey. If the enrollee reported receipt of private disability benefits and we had missing information on the amount, we used multiple imputation to fill in the missing information when constructing this measure.

d. Health at the time of the survey

- **Self-reported health is at least fair.** This binary measure indicates whether the enrollee rated their health as fair, good, very good, or excellent at the time of the survey.
- **Self-reported health is good or better.** This binary measure indicates whether the enrollee rated their health as good, very good, or excellent at the time of the survey.
- **Self-reported health is very good or excellent.** This binary measure indicates whether the enrollee rated their health as very good or excellent at the time of the survey.
- **Covered by health insurance.** This binary measure indicates whether the enrollee had health insurance at the time of the survey.
- **Number of poor physical health days in past month.** This measure indicates the number of days the enrollee perceived their physical health to be not good during the 30 days before the survey.
- **Number of poor mental health days in past month.** This measure indicates the number of days the enrollee perceived their mental health to be not good during the 30 days before the survey.
- **Pain score (range: 0 to 10).** This measure indicates how the enrollee rated their pain on average in the seven days before the survey, with 0 being no pain and 10 being the worst imaginable pain.
- **Pain interfered with work most or all the time.** This binary measure indicates whether the enrollee perceived that pain interfered with their normal work (outside of the home or housework) most or all of the time during the two months before the survey.
- **Was prescribed opioid pain relievers.** This binary measure indicates whether a doctor or health professional prescribed opioid pain relievers to the enrollee during the two months before the survey.

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Appendix B.

Analysis Methods

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A. Participation analysis methods

To analyze RETAIN service use, we produced descriptive statistics on each of the service use measures described in Appendix A. For each RETAIN service, we calculated the percentage of enrollees who used the service. For services associated with an expected duration, including the time to develop a RTW plan and enrollees' time enrolled in RETAIN, we also calculated the average number of days from start to end. For services associated with RTW communication, we also calculated the average number of communications.

We compared RETAIN service use between subgroups of enrollees to examine whether it differed by enrollee characteristics. We examined four service use measures that represent the main categories of RETAIN services: (1) the percentage of enrollees with an established RTW plan, (2) the percentage with two or more RTW coordinator communications, (3) the percentage who used or were referred to at least one service to support job retention, and (4) the percentage who used or were referred to at least one service to support job search or training. We examined whether service use differed by eight enrollee characteristics. These characteristics aligned with the subgroups of interest in the impact analysis and the contextual information that RTW coordinators recorded about factors that could pose challenges to work: age at enrollment (younger than 50; 50 and older), sex (female; male), education (no postsecondary education; any postsecondary education), primary diagnosis (musculoskeletal injuries; non-musculoskeletal injuries), time since the enrollee last worked (last worked within one week or less of enrollment; last worked within more than one week of enrollment); primary or secondary behavioral health condition (yes or no), dissatisfaction or conflict with current job or employer (yes or no), and reported problems with housing or economic circumstances (yes or no). We defined each characteristic as a binary variable and tested for differences between subgroups using a two-tailed *t*-test.

B. Impact analysis methods

As outlined in the evaluation design report (Berk et al. 2021), we examined each of the five RETAIN programs separately. The rationale for this approach is that even though all five programs broadly followed the same RETAIN program model, they varied substantially in their implementation of the model components. However, we took a common analysis approach to studying each program. In the sections below, we describe the methods we used for the impact analysis, the subgroup impact analysis, and the descriptive analysis.

1. Impact analysis methods

Random assignment should result in research groups that are, on average, similar in their characteristics at the time they enrolled in the evaluation. Therefore, a simple comparison of mean values of outcomes between the treatment and control groups should provide an unbiased estimate of program impacts. As described in Section B, baseline balance tests indicate that random assignment worked as intended in each RETAIN program. Accordingly, a simple comparison of the enrollee outcomes would provide an unbiased estimate of the impacts, on average.

To improve the statistical precision of the impact estimates and account for chance differences in baseline characteristics between treatment and control group members in each program, we computed regression-adjusted impact estimates using multivariate regression models. In all tables showing results

from the impact analyses, the means for the treatment group reflect regression-adjusted means. The approach we used to implement covariate adjustment is as follows (Exhibit A.20):

- For all programs, we included a core set of covariates.
- For all programs, we included the characteristics based on which we had stratified random assignment, to reflect the program's study design.
- For each program, we included additional covariates if we found any statistically significant differences in baseline characteristics between the treatment and control groups in the analysis sample.[14]

Exhibit B.1. Covariates used in regression-adjusted analyses of impacts, by program

Program	Control variables
All programs	Core covariates • Enrollee's age (7 categories) • Whether the enrollee was female • Enrollee's race and ethnicity (7 categories) • Enrollee's earnings in the quarter before enrollment • Enrollee's employment status at enrollment (3 categories) • Time since enrollee last worked (5 categories) • Type of injury or illness (5 categories)
RETAINWOR*KS*	Random assignment strata • Enrollee's age* (7 categories) • Whether the enrollee was female* • Enrollee's employment status at enrollment* (3 categories) • Time since enrollee last worked* (5 categories) • Enrollee's workforce region (5 categories) *Imbalanced characteristics* • Whether the enrollee was covered by health insurance • Occupational classification of enrollee's pre-injury or pre-illness job (6 categories) • Hours per week usually worked before injury or illness

[14] We tested for balance on the following baseline characteristics: sex, age, race and ethnicity, preferred language, education, type of illness, new injury or illness, injury or result of an accident, work-related injury or illness, injury or illness as part of a workers' compensation claim, time between injury or illness and enrollment (days), time between injury or illness and enrollment missing, enrolled before onset of injury or illness, employment status at enrollment, time since last worked at enrollment, hours per week usually worked before injury or illness, tenure at most recent job, occupational classification of pre-injury or pre-illness job, earnings in the quarter before the enrollment quarter, earned $1,000 or more in one of the past 12 months, receipt of income other than earnings, applied for or received SSDI or SSI in the past three years, and covered by health insurance.

Program	Control variables
RETAIN KY	Random assignment strata • Enrollee's age* (7 categories) • Whether the enrollee was female* • Enrollee's employment status at enrollment* (3 categories) • Time since enrollee last worked* (5 categories) *Imbalanced characteristics* • Enrollee's education (4 categories) • Whether the enrollee was covered by health insurance • Work-related injury or illness
MN RETAIN	Random assignment strata • Enrollee's age* (7 categories) • Whether enrollee was female* • Enrollee's employment status* (3 categories) • Time since enrollee last worked* (5 categories)
OH RETAIN	Random assignment strata • Enrollee's age* (7 categories) • Whether enrollee was female* • Enrollee's employment status* (3 categories) • Time since enrollee last worked* (5 categories) *Imbalanced characteristics* • Enrollee's preferred language • Whether enrollee applied for or received SSDI or SSI in the past three years • Time between enrollee's injury or illness and enrollment (days)
VT RETAIN	Random assignment strata • Practice size (7 categories) Imbalanced characteristics • Enrollee's preferred language • Occupational classification of enrollee's pre-injury or pre-illness job (6 categories) • Tenure at most recent job (5 categories)

Note: The imbalanced characteristics include only characteristics that did not overlap with core covariates.

* Already included as a core covariate; listed here for completeness.

To estimate impacts, we estimated a regression model of the following form for each program:

$$Y_i = \alpha + \beta Treatment_i + \lambda X_i + \varepsilon_i$$

where i denotes the individual observation, $Treatment_i$ denotes the indicator for assignment to the treatment group, X_i denotes the vector of covariates (strata, core, and imbalanced covariates), and ε_i denotes the error term. The coefficient β is the parameter of primary interest because it represents the estimate of the program impact. We estimated this model using linear regression methods.

We used different methods to estimate standard errors, depending on the random assignment level. For programs with individual-level random assignment, we produced heteroskedasticity-consistent standard errors using the method proposed by White (1980). For the program that used clustered random

assignment (VT RETAIN), we clustered standard errors at the medical practice level. This adjustment accounted for the fact that outcomes for people in the same medical practice might be correlated.

When examining survey-based outcomes, we specified probability weights to account for survey nonresponse and, in the case of OH RETAIN, sampling. For survey-based outcomes constructed using multiple imputation (see Section A.2.c), we used Stata's "mi" commands to estimate impacts.

For primary outcomes, we used one-sided *t*-tests and a *p*-value threshold of 0.10 to determine whether an estimated program impact on primary outcomes was statistically different from zero. We used a one-tailed test for these outcomes because we anticipated that RETAIN would do no harm: It either improves or has no effect on enrollee outcomes.[15] For all outcomes (primary and other), we used a two-sided t-test to assess whether the impact was statistically significantly different from 0. To calculate effect sizes for continuous outcome measures, we reported the standardized mean difference, known as Hedges' g, estimated by dividing the estimated impact by the pooled standard deviation of the outcome measure. For binary outcome measures, we first calculated the log odds ratio from the estimated mean and then calculated effect sizes by dividing the log odds ratio by 1.65, thus providing a statistic that reflected the difference in the probability of the occurrence of an event between the two groups (Cox 1970; What Works Clearinghouse 2022).

2. Supplementary analysis: Subgroup impacts

To understand whether the impacts of each RETAIN program varied across demographic groups, we estimated impacts on outcomes for key subgroups of enrollees. To minimize the risk of drawing spurious conclusions due to multiple comparisons, we analyzed only a selected set of subgroups defined by the baseline characteristics of enrollees: age at enrollment (younger than 50; 50 and older), sex (female; male), education (no postsecondary education, any postsecondary education), primary diagnosis (musculoskeletal injuries; non-musculoskeletal injuries), and time since last worked (last worked one week or less before enrollment; last worked more than one week before enrollment).

To estimate each set of subgroup impacts, we modified the regression models to include an indicator for each subgroup, as well as interaction terms between the treatment status indicator and the indicator variable for each subgroup. We estimated a regression model of the following form for each program:

$$Y_i = \alpha + \beta Treatment_i + \gamma Subgroup_i + \theta Treatment_i Subgroup_i + \lambda X_i + \varepsilon_i$$

where i denotes the individual observation, $Treatment_i$ denotes the indicator for assignment to the treatment group, and ε_i denotes the error term. $Subgroup_i$ represents the subgroup indicator, and X_i denotes the vector of covariates excluding the subgroup characteristic (strata, core, and imbalanced covariates). The sum of the coefficients θ and β represents the average program impact for individuals in the subgroup of interest, and β is the impact estimate for the remaining individuals. For example, when estimating impacts by age group, $\beta + \theta$ is the average impact of RETAIN on enrollees age 50 and older, and β is the average impact on enrollees younger than age 50. We estimated this model using linear regression methods.

[15] This approach was approved by the Technical Working Group during its third meeting (May 2019).

We used two-sided *t*-tests and a *p*-value threshold of 0.10 to determine the statistical significance of the regression-adjusted impact estimate for each subgroup. We also conducted a joint Wald test and a *p*-value threshold of 0.10 to determine whether the differences in the impact estimates between the subgroups were statistically significant. Because we are interested in understanding which subgroups benefited from RETAIN services, we discussed subgroup findings when we found statistically significant impacts for individual subgroups, even if those impacts did not differ statistically across subgroups.[16]

3. Supplementary analysis: Bayesian interpretation of program impacts

We used Bayesian methods to interpret the impacts of each RETAIN program while taking the broader context of other impact estimates into account. This enabled us to understand estimated impacts for specific programs considering broad patterns across the five RETAIN programs and previous demonstrations that focused on improving employment outcomes.

The backbone of the Bayesian approach is data-driven learning through partial pooling of data (sometimes referred to in the literature as Bayesian shrinkage). In partial pooling, the model learns from the data the degree of true variation in impacts across programs and subgroups. We used this data-driven learning to move the impact estimates for a program closer to the average impact across programs, in proportion to how precise the impact estimate is and the degree to which the model has learned that the impacts vary across programs. Bayesian methods also tap external evidence from existing studies to further contextualize results. For example, if other studies of similar programs suggest that impacts tend to be modest, then the model will be more skeptical of large estimates and will require more evidence to conclude that the effects truly are that large. On the other hand, if other evidence suggests that large impacts are plausible, then the model will be less skeptical.

We drew on existing evidence from the Pathways to Work Clearinghouse (Pathways) using results from the Bayesian meta-analysis presented in Shiferaw and Thal (2022), limiting the evidence to high-quality studies that analyzed outcomes over a period of less than 18 months. To test the sensitivity of using this body of evidence, we conducted a separate analysis in which we halved the model's reliance on the evidence.[17]

By combining prior evidence with partial pooling, Bayesian methods enable more precise estimates of the RETAIN programs' impacts because the model is drawing on all sources of information simultaneously. These methods also allow for more nuanced, policy-relevant conclusions about program impacts than traditional methods alone; for example, we report directly on the probabilities that a RETAIN program improved outcomes at all or improved an outcome by a substantial amount.

For the primary Bayesian model, we focused on estimating heterogeneity across the five RETAIN programs. We evaluated the three primary outcomes (employment in the fourth quarter after enrollment,

[16] If a RETAIN program was effective in improving outcomes for one subgroup but not its counterpart, we might find statistically significant impacts only for the first subgroup. Even if the difference in estimated impacts between the two subgroups is not statistically significant, due to uncertainty around the estimate for the second subgroup, the impacts for the first subgroup are still meaningful.

[17] We multiplied all standard deviations, a measure of the strength of the distributions reported in the other studies, by a factor of two. This doubles the uncertainty of the existing evidence, thus halving our reliance on that evidence.

earnings in the four quarters after enrollment, and application for SSDI or SSI in the 12 months after enrollment). Formally, the primary Bayesian model used the following equation:

$$\hat{\theta}_{oi} = \theta_o^{RETAIN} + \theta_{o,p[i]}^{Prog} + \varepsilon_{oi}$$

Using the impact estimates obtained from the methods described in Section B above,

- $\hat{\theta}_{oi}$ is the impact estimate for outcome o for RETAIN program $p[i]$, standardized to effect size units;
- θ_o^{RETAIN} is the overall effect of RETAIN for outcome o across all programs;
- θ_o^{Prog} is the program-specific effect for outcome o, capturing, for example, if one program had larger impacts; and
- ε_{oi} is the error term as determined by the standard error of the impact estimate, in effect size units.
- We set the following priors on these parameters, derived from Pathways:
- $\theta_o^{RETAIN} \sim N\left(0, \sigma^2_{\theta^{RETAIN}}\right)$, with $\sigma^2_{\theta^{RETAIN}}$ corresponding to half the variance around the term in the Pathways model jointly capturing study effects and intervention effects.
- $\theta_{o,p[i]}^{Prog} \sim N\left(0, \sigma^2_{\theta^{Prog}}\right)$, with $\sigma_{\theta^{Prog}} \sim gamma(\alpha, \lambda)$, with α and λ such that $\sigma^2_{\theta^{Prog}}$ has a mean that is the other half of the variance around the term capturing study effects and intervention effects in Pathways plus the variance around the term capturing variation of impacts within a study in Pathways, and a standard deviation of $\sigma^2_{\theta^{Prog}}$ that is half the mean.
- $\varepsilon_{oi} \sim N\left(0, \sigma^2\right)$, with σ corresponding to the impact estimate standard error, in effect size units.

We include a soft sum-to-zero constraint on $\theta_{o,p[i]}^{Prog}$ to improve identifiability.

Rather than a point estimate, the output of our Bayesian model is a distribution of all the possible values of the true impact for each program, as well as the overall cross-program estimate. We summarized these results using the posterior mean and standard deviation (analogous to the point estimate and standard error from a frequentist regression), as well as the 90 percent credible interval (analogous to a frequentist confidence interval), and the probability that the true impact is (1) positive and (2) larger than a threshold we would consider to be a "meaningfully large" impact. For earnings, we used a threshold of $500 as a large impact, which is roughly the midpoint for the impact that the RETAIN programs need to break even within 20 years (see Section C). For employment, we used a threshold of 3 percentage points, and for applications to SSDI and SSI, we used a threshold of 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

4. Sensitivity

We conducted several checks to assess the sensitivity of the impact estimates to different modeling approaches: (1) use of nonresponse weights, (2) covariate adjustment, and (3) multiple imputation. We describe the tests and findings below, and we present detailed results in Appendices C through G. We also assessed the sensitivity of the Bayesian analysis to changes in the prior specification.

a. Sensitivity to use of nonresponse weights

As described in Appendix A, Section A.2.b, in the main impact estimation models, we used weights to adjust the survey data for nonresponse and, in the case of OH RETAIN, sampling. However, nonresponse weights might not reduce nonresponse bias if the assumptions underlying the calculations of the weights did not adequately reflect the mechanisms that cause survey nonresponse. In addition, large variability in the nonresponse weights could increase the variance of the estimates. For these reasons, we produced estimates of each program's impacts without nonresponse weights to compare them to the main impact findings.

In general, the impact estimates for each RETAIN program were similar with and without the use of nonresponse weights. Across all states, there were small variations in the point estimates, but the detected program impacts remained statistically significant regardless of the use of weights. In a few instances, the use of weights affected whether the impact was statistically significant even if the point estimate remained unchanged. For example, in MN RETAIN, the point estimate of impact on pain score was 0.2 regardless of weighting but was only statistically significant in the model without weights (Appendix Exhibit E.9). As another example, in OH RETAIN, the point estimates of the impacts on use of public assistance, receipt of private disability benefits, and pain score were only slightly different with weighting, but they were only statistically significant in the model without nonresponse weights (Appendix Exhibit F.9).

b. Sensitivity to covariate adjustment

As described in Appendix A, Section C, we used covariate adjustment when estimating program impacts to increase the precision of estimates and control for differences in the baseline characteristics of the treatment and control groups that might have occurred by chance. However, in some situations covariate adjustment might reduce precision—for example, if irrelevant or highly correlated covariates or too many covariates are included. To assess the sensitivity of the findings to the adjustment, we produced estimates of program impacts without adjustment for (1) all covariates and (2) all covariates apart from characteristics used for stratification of random assignment.

The impact estimates for each program were generally similar when either adjusting by covariates or not, which is expected in a randomized study. For four of the five programs, most point estimates were identical or varied by only a few decimal points. For VT RETAIN, the differences relative to the adjusted results were larger, likely because in VT RETAIN there were more differences in enrollee characteristics between the treatment and control group at baseline.[18] The program's impacts on working for an employer that offered health insurance and on working for an employer that offered paid leave were negative and statistically significant in the unadjusted models (the impacts were smaller and not significant in the adjusted model). Use of covariate adjustment affected the statistical significance of VT RETAIN's impacts on government housing assistance amount and receipt of private disability payments, though the point estimates were similar regardless of adjustment. Finally, without covariate adjustment, the estimated impact on receipt of opioid prescriptions was smaller and not statistically significant. Given the baseline differences in characteristics between treatment and control enrollees in VT RETAIN, the

[18] VT RETAIN had a cluster randomized design and a relatively smaller number of enrollees, making it more likely that the treatment group and the control group have imbalances in baseline characteristics. There were significant differences between the two groups in sex, age, preferred language, and time since last worked at enrollment. Due to the cluster design, random assignment could not be stratified based on such enrollee characteristics.

adjusted impacts represent a more accurate picture of the impacts of the RETAIN program, whereas the unadjusted differences could partially reflect compositional differences between the treatment and control group.

In the other RETAIN programs, there were a few differences in the unadjusted estimates (compared to the adjusted estimates). RETAIN KY's impact on two labor force participation measures (being connected to an employer; being connected to an employer or looking for work) were statistically significant in the unadjusted analyses. In MN RETAIN, the impact on pain interfering with work most or all the time was not statistically significant though the point estimate was similar in size, and the impact on earnings above SGA in the third quarter after enrollment was statistically significant. In OH RETAIN, the impact on being employed in the first quarter after employment was statistically significant in the analyses that adjusted only for stratification-based covariates. In all of these cases, the point estimates were similar when either using covariate adjustment or not, but the standard errors differed.

c. Sensitivity to multiple imputation of conditionally missing data

As described in Appendix A, Section A.2.c, in the main impact estimation models, we used multiple imputation to address missing data for outcomes for which information could be missing only conditional on another outcome. To assess the sensitivity of the results to the use of multiple imputation, we estimated alternative models that did not use imputed data for outcomes that underwent multiple imputation. Overall, we found that the impacts estimated based on data that had not undergone multiple imputation were similar to those estimated by the main model.

d. Sensitivity of Bayesian analysis to prior specification

As described in Appendix A, Section D.3, we conducted a sensitivity analysis for the Bayesian modeling in which we halved the model's reliance on literature-derived prior information. Across RETAIN programs, results were robust to halving the strength of the priors (Exhibits C.11, D.11, E.11, F.11 and G.11). With these alternative priors, the estimated probability of an increase in earnings changed by a maximum of 3 percentage points (for VT RETAIN, from 10 to 7 percentage points); the estimated probability of an increase in employment changed by a maximum of 7 percentage points (for RETAINWOR*KS*, from 90 to 97 percentage points); and the estimated probability of a decrease in applications for SSI or SSDI changed by a maximum of 9 percentage points (for RETAINWOR*KS*, from 79 to 88 percentage points). No substantive conclusions changed.

C. Benefit-cost analysis methods

This section describes the framework, data, methods, and analyses we used to estimate the RETAIN programs' benefits and costs.

1. Goals and framework

The goals of the benefit-cost analysis were to help DOL, SSA, state agencies, and policymakers identify key cost drivers of the RETAIN programs and inform decision making about whether it is worthwhile to sustain such interventions or initiate similar interventions in the future. This analysis addressed two research questions:

1. **What are the benefits and costs of each RETAIN program?** If the RETAIN programs are effective in achieving their goals, we would expect to see RETAIN treatment enrollees have greater employment

and earnings, lower participation in SSA disability programs, better health and functioning, and greater economic well-being than control enrollees. The benefits stem from the impact of RETAIN programs on outcomes, benefiting enrollees or other stakeholders.

To assess the cost-effectiveness of the programs, we measured the program costs of delivering services in a steady-state period, and we estimated the benefits as well as the indirect costs that accrued to key parties as a result of the impacts of RETAIN programs on enrollee outcomes within one year after enrollment. The analysis excluded costs or benefits that are difficult to monetize, such as enrollee well-being.

2. **Are the benefits of each RETAIN program greater than its costs?** We conducted a benefit-cost analysis for each RETAIN program, combining benefit estimates with cost calculations. For each accounting perspective, we calculated net benefits by subtracting program costs and indirect costs from benefits, with a positive value indicating that the monetary value of the program's benefits outweighed its costs. We also calculated a benefit-cost ratio of the net benefits divided by program costs to capture the economic return per dollar spent on the program. We limited the assessment to the benefits and costs that are realized in the evaluation, though we included supplementary forecasting analyses to project benefits and costs over a longer time horizon.

Consistent with the evaluation design, we conducted the benefit-cost analysis separately for each RETAIN program, assessing steady-state costs and monetary benefits during the year following participants' enrollment.

We considered four accounting perspectives when we characterized benefits and costs:[19]

1. **Treatment enrollees.** A primary goal of the RETAIN programs was to help workers stay at work or return to work after an illness or injury, thus supporting their long-term economic well-being. Accordingly, we expect that many of the benefits of RETAIN programs would accrue to the program participants and their families. By evaluating benefits and costs from the treatment enrollees' perspective, we can assess the value of RETAIN programs for their intended beneficiaries.
2. **Federal government.** Another central goal of the RETAIN demonstration was to strengthen federal disability programs. By preventing some enrollees from entering SSDI and SSI programs in the long term, RETAIN programs could reduce SSA program expenditures and could also reduce expenditures for the Centers for Medicare & Medicaid Services, as SSDI awardees become eligible for Medicare after a 24-month qualifying period.[20] Further, by improving enrollee earnings, RETAIN programs might bolster federal funding through increased contributions via income and payroll taxes from enrollees. At the same time, DOL funded the RETAIN programs and bore the costs associated with

[19] Following SSA's recommendation, we revised perspectives (2) and (3) from "SSA" and "Other federal and state government agencies," as outlined in the Evaluation Design Report (Berk et al. 2021), to "Federal government" and "State government," reflecting DOL's funding of the intervention. We did not include employer perspectives. Depending on the extent to which RETAIN increases enrollees' employment and well-being, their employers might experience benefits and costs related to staff turnover, project disruptions, productivity, accommodations, and morale. However, the RETAIN program model did not directly target employer outcomes, and the evaluation has not collected data on their outcomes.

[20] Due to the one-year time frame of the benefit-cost analysis, we only estimated Medicare impacts in the forecasting analysis.

service delivery. For these reasons, we examined benefits and cost implications jointly for all federal government entities.

3. **State government.** RETAIN program impacts on enrollee outcomes might have translated into benefits and costs for state governments. For example, increased enrollee earnings could have boosted consumer spending and, in turn, led to increased sales tax and state income tax revenues for state governments.
4. **All key perspectives.** To assess benefits and costs from all key accounting perspectives, we aggregated them across the three groups above (treatment enrollees, federal government, and state government). This combined perspective is likely of greatest interest to policymakers, as finding positive net benefits would indicate that a RETAIN program increased the overall resources available to key parties.

Exhibit B.2 illustrates the expected direction in which resources will flow due to the RETAIN programs. It lists the monetary outcomes incorporated into the benefit-cost estimates as rows and each of the four perspectives as columns. Some program impacts might be a benefit to some groups but a cost to others. For example, reducing SSDI benefits is a benefit to the federal government but a cost to enrollees. For each outcome, the table indicates whether an increase in the outcome would represent a benefit (+ sign), cost (- sign), or neither (0) from the respective group's perspective. The bottom line for each column shows the difference between benefits and costs, indicating either total net benefits (if positive) or total net costs (if negative) for the relevant perspective.

Exhibit B.2. Expected net benefits (+) and costs (-) in the year after enrollment, by accounting perspective

Measure	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Program costs				
Personnel and labor costs (wages, fringe benefits)	0	-	0	-
Payments for providing services[a]	+	-	0	-
Outreach costs	0	-	0	-
Other direct costs	0	-	0	-
Administrative and overhead costs	0	-	0	-
RETAIN program costs not invoiced to DOL	0	-	0	-
Benefits and indirect costs				
Earnings	+	0	0	+
Fringe benefits	+	0	0	+
Income and sales taxes	-	+	+	0
Payroll taxes – OASDI	-	+	0	+
Payroll taxes – Medicare	-	+	0	+
Work- and childcare-related expenses	-	0	0	-
SSDI benefits	-	+	0	0
SSDI administrative costs	0	+	0	+
SSDI application processing costs	0	+	0	+

Measure	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
SSI payments	-	+	0	0
SSI administrative costs	0	+	0	+
SSI application processing costs	0	+	0	+
Medicaid benefits	-	+	+	0
Private short- or long-term disability payments	-	0	0	-
UI benefits[b]	-	0	+	0
UI administrative costs[b]	0	+	0	+
Workers' compensation benefits	-	0	+	0
SNAP benefits	-	+	0	0
SNAP administrative costs	0	+	+	+
Public housing assistance	-	+	0	0
Public housing assistance administrative costs	0	+	0	+
Net benefits	?	?	?	?

Note: The cells in this illustrative table present our a priori expectations regarding the direction of RETAIN program impacts and the benefits and costs of those impacts from four accounting perspectives. The actual tables in the evaluation report present empirical findings from the impact analysis and analysis of program costs.

Key: - indicates a cost, + indicates a benefit, 0 indicates no cost or benefit, and ? indicates uncertainty about whether a benefit or cost.

[a] Payments for providing services include enrollee stipends, incentive payments to providers, and payments for subcontractors that constituted less than 10 percent of expenditures (larger amounts are reflected in other cost categories).

[b] We assigned UI benefit impacts to the state government perspective, as state governments pay for the majority of UI benefits whereas the federal government pays for administrative costs (Stone and Chen 2014).

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance.

2. Data sources

To conduct the benefit-cost analysis, we used one-year impact estimates, program cost data, and external literature. Below, we describe the data sources for these measures.

a. Benefit and indirect cost data

- *Impact estimates*. We measured key benefits and indirect costs using impact estimates from the one-year impact analysis.
- *External literature*. To estimate some benefits and indirect costs, we used calculations that involve the impact estimates as well as parameters drawn from external data sources. We used these methods to estimate fringe benefits; work- and childcare-related expenses; income, sales, and payroll taxes; Medicaid costs; public benefit administrative costs; and SSDI and SSI application processing costs. We selected external data sources and samples closely aligned with the RETAIN enrollee sample and the study period, using 2024 data where available. We converted dollar-valued external data from years before 2024 into 2024 dollars using the Consumer Price Index for Urban Wage Earners and Clerical Workers (Bureau of Labor Statistics n.d.).

b. Program cost data

- *RETAIN grantee cost form*. Developed by Mathematica, this form was completed by each RETAIN program between March and May 2025 to collect cumulative costs over a 12-month steady-state cost accounting period.[21] The form captured costs invoiced to DOL and those not invoiced, categorized as personnel and labor costs (staff wages and fringe benefits), payments for providing services (including enrollee stipends, incentive payments to participants, and payments for subcontractors for amounts less than 10 percent of expenditures), outreach costs (such as payments for flyers, brochures, and radio advertisements), other direct costs (such as non-labor costs related to running online clinical research platforms), administrative and overhead costs, and costs not invoiced to DOL (such as the value of volunteer time). To facilitate data quality and consistency across the RETAIN programs, Mathematica provided detailed examples of costs for each category and met with program representatives to ensure that the programs consistently allocated their costs to comparable categories.
- *RETAIN enrollment data*. We used these data to calculate the number of treatment enrollees within the steady-state period, which we then used as the denominator for calculating the cost measures.

3. Estimation methods

We calculated benchmark estimates for RETAIN program costs, benefits and indirect costs, and benefit-cost summary measures. Exhibit B.2 summarizes the program costs, benefits, and indirect cost measures, as well as data sources, calculation methods, and modeling assumptions and considerations. In the main benefit-cost analysis, we only examined benefits and costs that were realized over a one-year period after enrollment, reflecting the time frame of the impact estimates.

a. Estimating program benefits and indirect costs

We estimated each benefit and indirect cost per enrollee by combining impact estimates with other information from enrollee survey data (for example, we used marital status and average household income to determine the appropriate tax rate, as discussed in Exhibit B.3) and external sources (for example, for the state sales tax rate). We reported the benefit and indirect cost measures and their sums by RETAIN program.

To obtain estimates for benefits and indirect costs, we used the point estimates of the program impacts even if the estimates do not differ from zero at conventional levels of statistical significance. Following Boardman's (2018) guidance, this approach provides a more accurate and complete accounting of the benefits of a program because it uses the best evidence available on the size of the impacts—our unbiased point estimates—even if they are imprecisely estimated. In a sensitivity analysis, described in Section D, we explored how the uncertainty around the impact estimates influenced the estimates of net

[21] We defined the 12-month steady-state cost accounting period as Quarter 2 2023 through Quarter 1 2024 (April 1, 2023, through March 31, 2024), when RETAIN programs were neither ramping up nor winding down services or closing out their caseloads. Focusing on this steady-state period makes the benefit-cost analysis findings most useful to inform thinking about marginal expansions in program enrollment. By examining benefits and costs per treatment enrollee (or service user) during this period, we can interpret findings as the benefits and costs of adding enrollees to an existing program.

benefits. This approach is consistent with the approach used in other SSA evaluations such as the Promoting Readiness of Minors in SSI evaluation (Patnaik et al. 2022).

For certain benefit and indirect cost calculations, we used parameters drawn from external sources (for example, the state sales tax rate as a percentage of personal income), as noted above. We assumed that measures derived from external data apply to RETAIN populations, thus assuming that RETAIN enrollees do not substantially differ from the samples from which the measures were derived. In a sensitivity analysis, we evaluated how alternative parameter values affected net benefit estimates.

b. Estimating program costs

We estimated program costs separately by RETAIN program over the steady-state period (Quarter 2 2023 through Quarter 1 2024). Using the RETAIN grantee cost form, we calculated total program costs by summing direct costs invoiced to DOL and non-invoiced indirect costs. These estimates may overstate the costs of service delivery for the treatment group under non-evaluation conditions because they could include costs related to the control group (for example, costs related to recruiting, enrolling, and delivering light-touch services to control group members) and participating in the evaluation (for example, time for staff attending meetings with the evaluation team). We did not include evaluation-related expenses that were easy to remove, such as the cost of technical assistance, valued at $10.4 million for Phases 1 and 2 collectively (U.S.A. Spending n.d.), and we did not include incentive payments to participants (we attributed the full incentive payment amount to the evaluation, although some programs may include participant incentive payments in a sustained program).

We reported the following cost measures by RETAIN program:

- *Program cost per treatment enrollee*. To compute the average program cost per treatment enrollee, we divided the total program cost over the 12-month steady-state period by the number of treatment enrollees who enrolled during the 12-month steady-state period. We used the program cost per treatment enrollee to compute benchmark benefit-cost summary measures.
- *Program cost breakdown*. We used RETAIN program responses to the cost form to summarize the proportion of RETAIN costs attributable to personnel/labor, costs of providing services, administrative/overhead costs, and other costs not invoiced to DOL. We report these measures in tables in the appendices, as shown in Appendix Exhibit B.1.

Exhibit B.3. Benefit-cost measures, values, sources, estimation methods, and modeling assumptions

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
Program costs			
Personnel and labor costs			
Wages for RETAIN staff across all healthcare and workforce partners (for activities related to recruiting and enrolling participants; implementing and delivering RTW coordination services; developing other resources; meetings between partners; and administrative time for project management, evaluation, and other training)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	Cost breakdowns by category require RETAIN program recordkeeping that enables this level of detail to be reported. Although the RETAIN grantee cost form defined each cost category and provided examples, and Mathematica met with each program to facilitate standard definitions, it is possible that RETAIN programs did not interpret the cost categories consistently, so cost breakdowns are not comparable across RETAIN programs.
Fringe benefits for RETAIN staff across all healthcare and workforce partners (costs for health insurance, retirement plans, and other fringe benefits)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages.
Payments for providing services			
Payments to subcontractors for amounts less than 10 percent of expenditures (payments on behalf of participants receiving services)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period; amounts greater than 10 percent were accounted for in other categories	RETAIN grantee cost forms	See Personnel and labor costs – Wages.
Incentive payments for providers (for example, compensation for completing referrals, completing trainings, submitting activity assessments, answering phone calls)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
Other costs			
Outreach costs (to providers, patients, or employers, such as payments for flyers, brochures, radio advertisements; costs to set up and run online recruitment platforms not included in the personnel or labor costs above; other *outreach costs)*	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages.
Other direct costs (such as non-labor costs related to running online clinical research platforms)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages.
Administrative and overhead costs (indirect costs)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages.
RETAIN program costs not invoiced to DOL (economic costs that do not appear in the budget such as volunteer time, donated goods, and leveraged resources)	Amount reported by RETAIN program divided by the number of treatment enrollees who enrolled during the 12-month steady-state period	RETAIN grantee cost forms	See Personnel and labor costs – Wages. Costs not invoiced to DOL may be inconsistently reported across RETAIN programs.
Benefits and indirect costs			
Earnings	Estimated impact on earnings in the four quarters after enrollment	Impact estimates	Impact estimates do not reflect out-of-state earnings nor earnings from the federal government, self-employment, and the informal sector.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
Fringe benefits	Estimated impact on earnings times the following multiplier: 45.3 percent	Impact estimates and literature: We used the average percentage of compensation that employers spend on fringe benefits for civilian workers—31.2 percent, based on 2024 fringe rates from the National Compensation Survey (U.S. Bureau of Labor Statistics 2024). Converting from a percentage of compensation to a percentage relative to earnings, this corresponds to 31.2/(100-31.2) = 45.3 percent of earnings.	Because not all enrollees may have received fringe benefits, we conducted sensitivity analyses excluding these benefits.
Federal income taxes	Estimated impact on earnings times the following multiplier: Average marginal federal income tax rate based on marital status and average household earnings in the RETAIN sample	Impact estimates, one-year follow-up surveys, and literature: To construct the multiplier, we used marginal federal tax rates and standard deduction information for married and single households from published IRS tax rules (IRS 2024). We estimated a weighted average of the marginal tax rate paid by the average married treatment enrollee and the average single treatment enrollee, based on marital status and last month's household earnings reported in the one-year follow-up surveys, extrapolated to 12 months: average tax rate = (percent married × tax rate corresponding to average annual earnings for married enrollees) + (percent single × tax rate corresponding to average annual earnings for single enrollees).	We assumed that RETAIN programs do not affect the earnings/income of other members of an enrollee's household. Because household income was derived from a mix of taxable and nontaxable sources, we used household earnings as a proxy for taxable income, which could underestimate tax rates. However, by using household earnings reported for the last month to estimate annual taxable income and construct the marginal tax rate, we assumed households would earn a similar amount each month. This could overestimate tax rates because we expect impacts on earnings to have emerged slowly over participants' year of enrollment. We assumed married enrollees filed taxes jointly. The average multiplier did not necessarily reflect the circumstances of RETAIN enrollees (such as personal deductions and credits) that might have affected enrollees' tax liability.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
State income taxes	Estimated impact on earnings times the following multiplier: Average marginal state income tax rate based on marital status and household earnings in the RETAIN sample	Impact estimates, one-year follow-up surveys, and literature: To construct the multiplier, we followed the same procedure for federal income taxes above, but constructed them separately by state, using state-specific tax rates and standard deductions (Kansas Department of Revenue 2024, Kentucky Department of Revenue 2024, Minnesota Department of Revenue 2024, Ohio Department of Taxation n.d., Vermont Department of Taxes n.d.).	See Federal income taxes.
State sales taxes	Estimated impact on earnings times the following multiplier: State-specific sales tax rates as a percentage of personal income	Impact estimates and literature: To construct the multiplier, we used 2022 data published by the Tax Foundation (Walczak 2024) that indicates sales tax revenue as a percentage of personal income by state. It ranges from 1.67 to 2.48 percent in the RETAIN program states.	We assumed the sales tax rate as a percentage of personal income was the same as the sales tax rate as a percentage of earnings and enrollees spent their additional earnings on items subject to sales tax.
Payroll taxes – OASDI	Estimated impact on earnings times the following multipliers: 6.2 percent for the enrollee perspective and 12.4 percent for the federal government perspective	Impact estimates and literature: We constructed a 12.4 percent multiplier for the federal government perspective by adding the employer plus employee shares of OASDI (10.6 percent) + disability insurance (1.8 percent) (IRS 2025; Committee for a Responsible Federal Budget 2024). We constructed a 6.2 percent multiplier for the enrollee perspective by only taking the employee shares.	We assumed all earnings were subject to payroll taxes. Because the RETAIN sample had few enrollees whose earnings exceed the Social Security payroll cap ($168,600 in 2024) (SSA n.d.-b), we assumed their earnings were not subject to this payroll cap. Payroll taxes were split between the employer and employee. We assumed the employee share (6.2 percent of earnings) represented a cost to RETAIN enrollees, while the employer plus employee shares represented a benefit to the government.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
Payroll taxes – Medicare	Estimated impact on earnings times the following multipliers: 1.45 percent for the enrollee perspective and 2.9 percent for the federal government perspective	Impact estimates and literature: We constructed a 2.9 percent multiplier for the federal government perspective by adding the employer plus employee shares of the Medicare Hospital Insurance tax (IRS 2025). This tax is split equally among employers and employees; therefore, enrollees pay a 1.45 percent Medicare Hospital Insurance tax.	We assumed all earnings were subject to payroll taxes. Because the RETAIN sample had few enrollees whose earnings exceeded $200,000, we assumed their earnings were not subject to the additional 0.9 percent Medicare tax for individuals with earned income of more than $200,000 ($250,000 for married couples filing jointly [IRS 2025]).
Work- and childcare -related costs	Estimated impact on earnings times the RETAIN-specific multiplier representing the ratio of work- and childcare-related costs to household earnings	Impact estimates and literature: We constructed a multiplier by dividing median capped annual work- and childcare-related expenses in 2023 based on Current Population Survey Annual Social and Economic Supplement data ($1,737) (Congressional Research Service 2024a), inflation-adjusted to 2024 dollars, by median household earnings in the RETAIN samples.	We assumed that work- and childcare-related expenses were a fixed function of earnings, but we included a sensitivity analysis in which we treated them as a fixed cost.
SSDI benefits	Impact estimate of SSDI benefit amount in the 12 months after enrollment	Impact estimates	

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
SSDI application costs	Impact on the probability of SSDI applications times the following multiplier: • $690	Impact estimates and literature: The total limitation on administrative expenses (LAE) outlays for SSDI in 2023 were $2,424 million (Congressional Research Service 2024b). 27 percent of total LAE (across OASDI and SSI) was spent on processing initial disability claims (Congressional Research Service 2024b). We assumed that the share of LAE outlays for the SSDI program spent on processing SSDI initial claims was also 27 percent, representing $654 million in outlays. In 2022 (the latest year for which data were available), there were 0.976 million initial SSDI applications (SSA 2024c). We divided $654 million by 0.976 million applications to arrive at the average cost of processing an SSDI application ($670), which we then inflation-adjusted from 2023 to 2024 dollars ($690).	The share of total LAE outlays for processing all initial claims (OASDI and SSI) was 27 percent. We assumed that the share of LAE outlays for the SSDI program spent on processing SSDI initial claims was also 27 percent.
SSDI administrative costs	Estimated impact on SSDI benefits times the following multiplier: • 0.38 percent	Impact estimates and literature. Total LAE outlays as a share of SSDI benefits were 1.6 percent, and 24 percent of all LAE outlays were spent on post-entitlement services. We multiplied 1.6 percent by 24 percent to arrive at LAE spending on benefit processing and post-entitlement services as a share of SSDI benefits (0.38 percent) (SSA 2024a).	We assumed administrative costs as a percentage of benefit payments was constant.
SSI payments	Estimated impact on SSI payment amount in the 12 months after enrollment	Impact estimates	This measure included only federal SSI payments; we did not have data on state supplemental SSI payments.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
SSI application costs	Estimated impact on the probability of SSI applications times the following multiplier: • $1,385	Impact estimates and literature: Total LAE outlays for SSI in 2023 were $4,626 million (Congressional Research Service 2024b). 27 percent of total LAE (across OASDI and SSI) was spent on processing initial disability claims (Congressional Research Service 2024b). We assumed that the share of LAE outlays for the SSI program spent on processing SSI initial claims was also 27 percent, representing $1,249 million in outlays. In 2023, there were 0.927 million initial SSI applications (SSA 2024b). We divided $1,249 million by 1.5 million applications to arrive at the average cost of processing an application ($1,347), which we then inflation-adjusted from 2023 to 2024 dollars ($1,385).	The share of total LAE outlays on processing all initial claims (OASDI and SSI) was 27 percent. We assumed that the share of LAE outlays for the SSI program spent on processing SSI initial claims was also 27 percent.
SSI administrative costs	Estimated impact on SSI payments times the following multiplier: • 1.75 percent	Impact estimates and literature: Total LAE outlays as a share of SSI payments are 7.3 percent, and 24 percent of all LAE outlays are spent on post-entitlement services (SSA 2024a). We multiplied 7.3 percent by 24 percent to arrive at LAE spending on benefit processing and post-entitlement services as a share of SSI payments (1.75 percent).	See SSDI administrative costs.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
Medicaid benefits	Estimated impact on the probability of SSI receipt in the 12 months after enrollment times the following multiplier: $30,290 x average number of months SSI recipients in Year 1 were enrolled in Medicaid / 12. This amount was split between federal and state government perspectives, with the following proportion going to the federal government: • RETAINWOR*KS:* 64.9 percent • RETAIN KY: 81.7 percent • MN RETAIN: 63.6 percent • OH RETAIN: 74.0 percent • VT RETAIN: 65.7 percent.	Impact estimates and literature: The average annual Medicaid expenditure for a beneficiary with disabilities was $28,363 in 2023 (MACPAC 2024), which we inflation-adjusted to 2024 dollars ($30,290). We multiplied this by the average number of months SSI recipients were enrolled in Medicaid in the year after enrollment. We calculated this average by using SSA data to determine the average timing of SSI award among enrollees who received SSI one year post-enrollment. This amount was split between federal and state government perspectives based on the federal share of Medicaid expenditures for fiscal year 2023 (the latest available), which ranged from 63.6 percent (MN) to 81.7 percent (KY) in study states (KFF 2024).	We assume that enrollees receiving SSI also received Medicaid and that Medicaid enrollment happened simultaneously with SSI award, although not all states have automatic enrollment (Kansas requires a separate application, and Minnesota applies additional Medicaid eligibility criteria) (SSA n.d.-c). The statistic for annual average Medicaid expenditures is based on available data but does not account for differences across the RETAIN programs in types of impairments among enrollees.
Short- or long-term private disability benefits	Estimated impact on household private disability benefit amount in the past month, multiplied by 6 months (for short-term benefits) plus that same impact multiplied by an additional 6 months for 6.6 percent of the cohort who we estimated transitioned to long-term benefits: Monthly impact on private disability benefits × [6 months + 6.6 percent X 6 months]	Impact estimates and literature: Based on Integrated Benefits Institute health and productivity benchmarking data from 2011 to 2015, 6.6 percent of short-term disability claimants exhaust their short-term disability benefits and transition to long-term disability (Contreary et al. 2018). The median duration of benefit receipt is 26 weeks (6 months, SHRM n.d.); thus, all enrollees received 6 months of benefits, and we estimated that 6.6 percent of enrollees received an additional 6 months of benefits.	Self-reported survey data may be inaccurate. Impacts in the prior month may miss enrollees receiving disability benefits earlier in the year; at the same time, some enrollees may not have received short-term benefits for the full 6 months and long-term benefits for the full 12 months of the analysis time frame.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
UI benefits	Estimated impact on UI benefit amount in the past month, multiplied by 12	Impact estimates multiplied by 12	Self-reported survey data may be inaccurate. We assumed that one-month impacts were reflective of monthly impacts over the 12-month analysis time frame. We assigned UI benefit impacts to the state government perspective because state governments pay for the majority of UI benefits (Stone and Chen 2014).
UI administrative costs	Estimated impact on UI benefits times the following multiplier: 12.2 percent multiplied by 12	Impact estimates and literature: The multiplier corresponds to the nationwide total UI administrative costs in 2022 (the latest year available), $4.0 billion, [Needels et al. 2024] divided by the total benefits paid in 2023, $32.7 billion [DOL 2024]).	See SSDI administrative costs.
Workers' compensation benefits	Estimated impact on household workers' compensation benefit amount in the past month, multiplied by the average duration of temporary disability benefits (3.1 months).	Impact estimates and literature: The average duration of temporary disability is 94 days, or 3.1 months, according to the National Council on Compensation Insurance (Bitu et. al 2023).	See Short- or long-term private disability benefits. We did not include administrative costs associated with workers' compensation benefits because those are borne by the employer and we do not include the employer perspective in the benefit-cost analysis. We assumed most enrollees were not federal employees and thus would be covered by state workers' compensation programs. We assumed that all RETAIN enrollees claiming workers' compensation claimed temporary total disability benefits. While in 2019, temporary total disability claims were 67.1 percent of all cash claims (Welch et al. 2024), the share of temporary disability cases among RETAIN workers' compensation claims may be higher because those who enroll into RETAIN may be more likely to be able to work in the short- or medium-term future.

Measure	Value or calculation method	Information source(s)	Modeling assumptions and considerations
SNAP benefits	Estimated impact on SNAP benefit amount in the past month, multiplied by 12	Impact estimates multiplied by 12	See UI benefits.
SNAP administrative costs	Estimated impact on SNAP benefits multiplied by 12, times the following multipliers: • 6 percent for the state government • 1 percent for the federal government	Impact estimates and literature: The multiplier corresponds to the percentage of SNAP spending for state and federal administrative costs, respectively, in 2023 (Center for Budget and Policy Priorities 2024).	See SSDI administrative costs.
Government housing assistance benefits	Estimated impact on government housing assistance benefit amount in the past month, multiplied by 12	Impact estimates multiplied by 12	See UI benefits. We assumed that impacts on subsidized housing benefits would accrue to the federal government, given that the federal government provides the majority of funding for housing assistance programs in the United States (Schwartz 2021).
Government housing assistance administrative costs	Estimated impact on public housing assistance benefits multiplied by 12, times the following multiplier: 8.6 percent	Impact estimates and literature: We used a multiplier of 8.6 percent ($2,770,935,000 /$32,386,831,000) based on 2024 administrative fees and total amounts appropriated by Congress to fund the Housing and Urban Development Housing Choice Voucher Program (U.S. Department of Housing and Urban Development 2024).	See SSDI administrative costs and government housing assistance benefits.

DOL = U.S. Department of Labor; LAE = Limitation on Administrative Expenses; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance.

c. Benefit-cost summary measures

By combining measures of direct costs, indirect costs, and benefits, we calculated and reported on the following benchmark summary measures for each RETAIN program by each of the four accounting perspectives:

- **Net benefits per treatment enrollee** = benefit per treatment enrollee – indirect cost per treatment enrollee – program cost per treatment enrollee

  For each accounting perspective, we calculated net benefits by subtracting direct and indirect costs from benefits. A positive value of this statistic indicates that the monetary value of a project's benefits outweighs its costs.

- **Benefit-cost ratio** = net benefits per treatment enrollee ÷ program costs per treatment enrollee

  For each accounting perspective, we calculated the benefit-cost ratio by dividing the net benefits by the program costs, from that accounting perspective. This statistic captures the economic return per dollar spent on the program, from that accounting perspective. If a given perspective did not incur program costs, the benefit-cost ratio was not applicable for that perspective and was marked as "n.a."

d. Considerations that could lead to over- or underestimation of net benefits

Exhibit B.4 summarizes considerations that could cause us to over- or underestimate net benefits from all key perspectives combined.

Exhibit B.4. Potential over- or underestimation of net benefits for all key perspectives combined

Considerations	Potential implications for net benefits
Average costs during the steady-state period do not capture the variation in intensity throughout the study period.	We might underestimate net benefits if costs per enrollee during the steady-state period were higher than during the scale-up or scale-down period of implementation, and overestimate net benefits if they were lower.
We did not capture costs related to workforce or VR program referrals; the enrollee survey does not collect this information.	We might overestimate net benefits (underestimate costs). Although we capture some workforce costs as part of RETAIN program costs, we miss VR costs and any workforce costs not paid for by RETAIN.
We did not capture benefits or costs that are not quantifiable in dollars, such as impacts on standard of living (Ben-Shalom and Burak 2016; Schimmel and Stapleton 2012), health and well-being (Waddell and Burton 2006; Strully 2009), productivity, and loss of non-market time (Greenberg and Robins 2008).	We might underestimate net benefits due to not accounting for expected improvements in standard of living, health, well-being, and productivity; we might overestimate net benefits due to not accounting for the cost of losing non-market time.
We did not capture benefits or costs that cannot be observed in the available data, including those associated with medical services (which could increase or decrease), service use outside of RETAIN, or private health insurance.	Implications for net benefits are unclear because the direction of impacts on use of services outside of RETAIN and medical services is ambiguous.
We may overestimate SSDI or SSI payment amounts in future years, as amounts paid to beneficiaries who are newly awarded may include back-payments from the beneficiary's protective filing datal.	If RETAIN reduced applications to SSA programs, we would overestimate the benefits from fewer SSA outlays.

Considerations	Potential implications for net benefits
We did not capture benefits and costs to entities other than the four key accounting perspectives, such as employers and insurance providers.	Implications for net societal benefits are unclear.
By design, we did not account for the costs related to the programs starting up or winding down.	We might overestimate net benefits.
Costs include components that may not be applicable to a RETAIN scale-up, such as administrative costs related to the evaluation, or provider incentive payments.	We might underestimate net benefits. Scaled-up versions of the programs might enjoy economies of scale in costs such as those for facilities, staff, recruitment materials, and outreach campaigns.
We divide total direct costs by the number of treatment enrollees, but total costs capture costs for treatment and control group members.	We might underestimate net benefits per treatment enrollee. The services that control group members received were minimal (that is, costs for recruiting/enrollment and any light-touch services), so the amount of bias should be small .

AIR = American Institutes for Research; VR = vocational rehabilitation.

4. Supplementary analysis: Break-even analysis

The direct program costs of delivering services were incurred up front during the evaluation period, but the benefits and indirect costs may continue to accrue and compound over time, including beyond the evaluation period. During the one-year evaluation period, we did not observe many of the programs' expected benefits, such as reductions in long-term SSDI outlays. To address this issue, we conducted a supplementary analysis that expanded the timeframe of interest beyond the year following enrollment. Specifically, we calculated the annual earnings impact needed for each program to break even—that is, for the benefits to equal costs—within five, 10, and 20 years after enrollment. This analysis involved forecasting benefits and indirect costs (other than those related to earnings) that would accrue in the future.

The goal of the analysis was to understand how large the impact on earnings would have to be for RETAIN program benefits to equal the costs in five, 10, and 20 years after enrollment. To do so, we forecast how benefits and indirect costs not related to earnings would accrue over time if the program impacts on non-earnings outcomes remained the same as in the one-year analysis. Then, we estimated the annual earnings impacts that would be needed for cumulative net benefits from all key accounting perspectives to be zero, five, 10, and 20 years after enrollment.

Below, we provide more details on how we forecast cumulative benefits for each benefit or indirect cost category. Given the uncertainty inherent in projecting long-term impacts, we developed a benefit-cost analysis tool for SSA to track long-term benefits and costs through 20 years as impact estimates beyond the first year after enrollment become available.

e. Assumptions for forecasting future benefits and costs unrelated to earnings

We assumed there are no direct program costs beyond the one-year period. To calculate the present value of expected future benefits and indirect costs, we accounted for the following:

- **Opportunity cost.** We converted all future benefits and costs to their present value using the most recent rate that SSA used in its actuarial projections of the SSA fund balance at the time of the analysis (SSA Board of Trustees 2024).

- **Retirement.** We accounted for retirement by multiplying the relevant impact estimates (for example, projected impacts on earnings) by the proportion of enrollees under the full retirement age in that year. We assumed that the full retirement age was 67 for all enrollees.[22]
- **Mortality.** We accounted for enrollee mortality using annual rates corresponding to the average age of the RETAIN cohorts for each year in the future. Each year's costs and benefits, described below, were multiplied by the proportion of enrollees we expect to be alive in that year.

We also assumed that enrollees receiving benefits will continue to do so in the future, and that enrollees not receiving benefits will continue not receiving benefits, except for SSDI and SSI applicants. For SSDI and SSI, we assumed that a share of those who applied would receive benefits in the future. The forecasting analysis relied on the additional inputs from the literature detailed in Exhibit B.5 and on statistics computed from RETAIN data shown in Exhibit B.6.

Exhibit B.5. Additional inputs derived from the literature to forecast expected future benefits and costs: values, sources, estimation methods, and modeling assumptions

Measure	Value	Sources, estimation methods, and considerations
Estimated percentage of SSI applicants who are awarded SSI	45.3 percent	45.3 percent was the allowance rate in 2019, the latest year in which less than 1 percent of SSI applications were pending a final decision (SSA 2024b). The allowance rate was calculated by dividing medical allowances by all medical decisions.
Estimated percentage of disabled-worker applicants who are awarded SSDI benefits	51.1 percent	51.1 percent was the allowance rate in 2019, the latest year in which less than 1 percent of SSDI applications were pending a final decision (SSA 2024c).
Average annual SSI payment among new SSI awardees	$8,332	We calculated the annual amount by multiplying the average payment amount in December 2023 by 12 ($8,100) (SSA 2024d), then inflation-adjusting it from 2023 to 2024 dollars ($8,332).
Average annual SSDI benefit among new SSDI awardees	$18,974	We calculated the annual amount by multiplying the average monthly benefit in 2023 ($1,537.13, SSA 2023) by 12, ($18,446), then inflation-adjusting it from 2023 to 2024 dollars ($18,974).
Average annual Medicare expenditures for beneficiaries with disabilities	$24,192	This average is from 2021 and is among all Medicare beneficiaries younger than 65 ($20,885) (MedPAC 2024); we inflation-adjusted it from 2021 to 2024 dollars ($24,192).

SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

[22] The full retirement age is 67 years for enrollees who were born in 1960 or later. Only 5 percent of enrollees in our sample were born before 1960.

Exhibit B.6. Additional inputs computed from RETAIN treatment sample data for the supplementary forecasting analysis

Measure	RETAINWORK*S*	RETAIN KY	MN RETAIN	OH RETAIN	VT RETAIN
Average treatment enrollee age at baseline	43.0	41.6	44.5	44.5	41.7
Percentage younger than 67, for Years 1 through 20 following program enrollment	60.5	61.5	60.2	52.0	66.0
Percentage younger than 65, for Years 1 through 20 following program enrollment	52.8	55.7	54.5	47.4	59.8

f. Calculations for forecasting future benefits and costs unrelated to earnings

Below, we describe how we projected each benefit and indirect cost component into the future. We also describe the calculations using equations in Exhibit B.7.

SSDI and related benefits. We calculated cumulative SSDI benefits by adding SSDI benefits received in the year after enrollment to a projection of future benefit receipt based on SSDI applications. We conservatively assumed there would be no impacts on SSDI applications after the first year. We estimated benefit receipt as follows: the impact on SSDI benefits in the year after enrollment + the sum of [(impact on SSDI applications) x (share of applications that are awarded SSDI) x (average SSDI amount)] between Year 2 and Year k after enrollment (or age 67).

To calculate cumulative administrative costs and application costs, we applied the relevant multipliers to the cumulative SSDI impact.

SSI and related benefits. We followed calculations analogous to those for SSDI and related benefits to calculate cumulative SSI payments and cumulative SSI administrative costs, except that payments would continue to accrue until death or the end of the time interval.

Medicare benefits. We assumed that all individuals who receive SSDI would enroll in Medicare two years later and remain in Medicare for all future years (RETAIN impacts would end at age 65, when all would qualify for Medicare). We estimated the corresponding cumulative Medicare costs by adding Medicare cost estimates in the year after enrollment to a projection of Medicare costs in future years, which corresponded to the following:

- (point estimate of impact on SSDI receipt in the year after enrollment) x (average expenditures per Medicare beneficiary with disabilities) for Year 3 +
- [(point estimate of impact on SSDI applications in the year after enrollment) x (percentage of SSDI applicants who would be awarded benefits) x (average expenditures per Medicare beneficiary with disabilities)] for the fourth year after enrollment up to age 65.

This amount represents a benefit to RETAIN treatment enrollees and a cost to the federal government.

Medicaid benefits. Following the method we used for the main benefit-cost analysis, we assumed that all individuals who enroll in SSI would simultaneously enroll in Medicaid. For the forecasting analysis, we assumed enrollees would remain in Medicaid for all future years. Corresponding Medicaid costs were estimated as follows:

- (impact on Medicaid benefits in the year after enrollment, described in Exhibit) +
- the sum of [(the estimated impact on SSI applications) x (percentage of SSI applicants who would be awarded benefits) x (average expenditures per Medicaid beneficiary with disabilities)] over subsequent *k* through one years.

UI benefits. We assumed enrollees would not receive UI benefits after the year following enrollment. The five states involved in RETAIN have a maximum benefit duration that ranges from 12 to 26 weeks. If we assume that enrollees who collect UI begin receiving it in the six months after their enrollment into RETAIN, they would have exhausted benefits by the end of the year following enrollment.

Workers' compensation. We assumed that enrollees would not receive workers' compensation benefits after the year following enrollment. We assumed that all RETAIN enrollees who claim workers' compensation are temporary total disability cases (and that there are no permanent partial disability cases). The average duration of temporary total disability claims is 3.1 months. If we assume that enrollees who receive workers' compensation benefits begin receiving it in the nine months after their enrollment into RETAIN, they would have exhausted their benefits by the end of the year following enrollment.

SNAP benefits. We computed cumulative SNAP benefits at Year *k* after program enrollment by first multiplying the estimated monthly impact on SNAP benefits by 12 to obtain a yearly impact estimate, and then multiplying this quantity by Year *k*. We assumed that enrollees who receive SNAP benefits would continue to do so in all future years. To calculate cumulative administrative costs, we applied the relevant multiplier to the cumulative SNAP benefit impact.

Public housing assistance. We computed cumulative public housing benefits received at Year *k* following the same approach that we used to calculate cumulative SNAP benefits in Year *k*.

Short-term and long-term disability benefits. We computed cumulative short-term (ST) and long-term (LT) disability benefits from private disability insurance at Year *k* after program enrollment as follows:

- The (derived impact on ST and LT disability benefits in the first year) +
- the sum of [(the percentage of people who exhaust their ST benefits and transition to LT benefits) x (the monthly impact on ST and LT disability benefits) x 12 x (the share of the treatment sample younger than the age of 67 in Year *i*)] over years $i = 2$ through *k*.

Exhibit B.7. Detailed methods for calculating cumulative future benefits and indirect costs

Category	Equation	Definition of terms	Assumptions
Earnings, fringe benefits, and taxes	Cumulative earnings impact at Year k = $\Delta Earnings + \sum_{i=2}^{k} (\Delta Earnings \times Share\,under\,67_i \times Share\,alive_i \times Opportunity\,cost_i)$ We used the same method to calculate cumulative impacts at Year k on fringe benefits, taxes, and work- and childcare-related costs.	$\Delta Earnings$ is the estimated impact on earnings one year after enrollment. Share under 67_i is the share of treatment enrollees younger than 67 in Year i. Share alive $_i$ is 1 - the mortality rate corresponding to the average age of RETAIN treated enrollees in Year i, obtained from the literature. Opportunity cost $_i$ is the most recent discount rate that SSA used in its actuarial projections. Note that all values and data sources for these and other terms in this table are noted in Sections C.2 and C.3.	Enrollees would exit the workforce at age 67. Mortality rates for enrollees younger than 67 would be similar to average U.S. age-based mortality rates.

Category	Equation	Definition of terms	Assumptions
SSDI	Cumulative SSDI benefit impacts at Year k = $\Delta SSDI\ benefits$ +[$\Delta SSDI\ applications \times W_{SSDI} \sum_{i=2}^{k} A_{SSDI} \times Share\ under\ 67_i \times Share\ alive_i \times Opportunity\ cost_i$] To calculate SSDI administrative costs, we multiplied cumulative SSDI benefit impacts at Year k by *Admin Costs* $_{SSDI}$. Cumulative SSDI application costs would be the same as application costs in the year after enrollment because we assumed no new applications beyond the first year after enrollment.	$\Delta SSDI\ benefits$ is the estimated impact on SSDI benefits in the one year after enrollment. *SSDI application costs* is the measure of SSDI application costs in the year after enrollment, described in Exhibit . $\Delta SSDI\ applications$ is the estimated impact on SSDI applications in the year after enrollment. W_{SSDI} is the percentage of SSDI applicants who would be awarded SSDI benefits, obtained from the literature. A_{SSDI} is the average annual SSDI amount for new awardees, obtained from the literature. *Admin Costs* $_{SSDI}$ is the multiplier used to calculate SSDI administrative costs, described in Exhibit B.3.	There would be no additional impacts on SSDI applications or benefits after Year 1. The share of SSDI applicants who would be awarded SSDI benefits is equivalent for the treatment and control groups. Changes in age, employment, and income in the future would not change the amount of SSDI. At age 67, all enrollees would qualify for Social Security retirement benefits. We assumed no new applications beyond the first year after enrollment because we do not have data on impacts on applications beyond Year 1 for all enrollees.
Medicare	Cumulative Medicare benefits at Year k = $(\Delta SSDI\ receipt \times A_{Medicare}) \times Share\ under\ 65_3 \times Share\ alive_3 \times Opportunity\ cost_3$ $+\sum_{i=4}^{k}[\Delta SSDI\ applications \times W_{SSDI} \times A_{Medicare} \times Share\ under\ 65_i \times Share\ alive_i \times Opportunity\ cost_i]$	$\Delta SSDI\ receipt$ is the estimated impact on SSDI receipt one year after enrollment. $A_{Medicare}$ is the average expenditures per Medicare beneficiary with disabilities. *Share under 65* ^{i} is the share of treatment enrollees younger than 65 in Year *i*. $\Delta SSDI\ applications$ is the estimated impact on SSDI applications in the year after enrollment. W_{SSDI} is the percentage of SSDI applicants who are awarded SSDI benefits, obtained from the literature.	Applicants who applied for SSDI within 12 months of RETAIN enrollment and were awarded SSDI would enroll in Medicare two years later (three years after RETAIN enrollment) and would remain in Medicare for all future years. At age 65, all enrollees qualify for Medicare.

Category	Equation	Definition of terms	Assumptions
SSI	Cumulative SSI payment impacts at Year *k* = $(\Delta SSI\ benefits\ ) + \left(\Delta SSI\ applications \times W_{SSI}\right) \times \sum_{i=2}^{k}[A_{SSI} \times Share\ alive_i \times Opportunity\ cost_i]$ To calculate SSI administrative costs, we multiplied cumulative SSDI benefit impacts at Year *k* by *AdminCosts* $_{SSI}$. Cumulative SSI application costs would be the same as application costs in the year after enrollment because we assumed no new applications beyond the first year after enrollment.	$\Delta SSI\ payments$ is the estimated impact on SSI payments in the year after enrollment. *SSI application costs* is the measure of SSDI application costs in the year after enrollment, described in Exhibit . $\Delta SSI\ applications$ is the estimated impact on SSI applications in the year after enrollment. *W* $_{SSI}$ is the percentage of SSI applicants who would be awarded SSI payments, obtained from the literature. *A* $_{SSI}$ is the average annual SSI amount for awardees, obtained from the literature. *AdminCosts* $_{SSI}$ is the multiplier used to calculate SSI administrative costs, described in Exhibit .	Same assumptions as those for estimating cumulative SSDI benefit impacts and costs at Year *k*.
Medicaid	Cumulative Medicaid benefits at Year $k = \left(\Delta Medicaid\ benefits\right) + \sum_{i=2}^{k}[\Delta SSI\ applications \times W_{SSI} \times A_{Medicaid} \times\ Share\ alive_i \times Opportunity\ cost_i]$ These benefits are split between federal and state perspectives, as is done for the main analysis.	$\Delta Medcaid\ benefits$ is the derived measure of impacts on Medicaid benefits in the year after enrollment, described in Exhibit . $\Delta SSI\ applications$ is the estimated impact on SSI applications one year after enrollment. *W* $_{SSI}$ is the percentage of SSI applicants who would be awarded SSI payments, obtained from the literature. *A* $_{Medicaid}$ is the average annual expenditures per Medicaid beneficiary with disabilities.	Applicants who applied for SSI within 12 months of RETAIN enrollment and were awarded SSI would enroll in Medicaid the same year (one year after RETAIN enrollment) and remain in Medicaid for all future years.

Category	Equation	Definition of terms	Assumptions
Short- or long-term disability benefits	Cumulative ST/LT disability benefits impact at Year *k*= $\Delta ST\ and\ LT\ disability\ benefits \times [M_{st} + W_{LT}(12 - M_{st})] +$ $\sum_{i=2}^{k}(\Delta ST\ and\ LT\ disability\ benefits \times 12 \times W_{LT} \times Share\ under\ 67_i \times Share\ alive_i \times Opportunity\ cost_i)$	$\Delta ST\ and\ LT\ disability\ benefits$ is the impact on ST and LT disability payments in the month before the survey. M_{st}=Average duration of ST disability receipt. W_{LT} = Share of people who exhaust their ST benefits and transition to LT benefits.	Enrollees would exit the workforce at age 67. ST disability benefits would not be received in years after the first year after enrollment because the standard duration is 12–52 weeks with a median of 26 weeks. LT disability benefits would continue until retirement at age 67.
SNAP benefits and administrative costs	Cumulative SNAP benefits impact at Year *k*=) $\sum_{i=1}^{k}(\Delta SNAP\ Benefits \times 12 \times Share\ alive_i \times Opportunity\ cost_i$ To calculate SNAP administrative costs, we multiplied cumulative unemployment benefits at year k by *Costs* $_{SNAP}$, split between federal and state perspectives, as is done for the main analysis.	$\Delta SNAP\ benefits$ is the impact on SNAP benefits in the month before the survey. *Costs* $_{SNAP}$ is the multiplier used to calculate SNAP administrative costs, described in Exhibit .	Enrollees receiving SNAP would continue to receive SNAP in all future years, and there would be no future changes to SNAP impacts.
Public housing benefits and administrative costs	Cumulative housing assistance benefits impact at Year *k*= $\sum_{i=1}^{k}(\Delta Housing\ assistance \times 12 \times Share\ alive_i\ x\ Opportunity\ cost_i)$ To calculate public housing administrative costs, we multiplied cumulative unemployment benefits in Year *k* by *Costs* $_{PHA}$.	$\Delta Housing\ assistance$ is the impact on housing benefits in the month before the survey. *Costs* $_{PHA}$ is the multiplier used to calculate public housing assistance administrative costs, described in Exhibit .	Enrollees receiving housing assistance would continue to receive housing assistance in all future years, and there would be no future changes to housing assistance impacts.

LT = long-term; SNAP = Supplemental Nutrition Assistance Program; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; ST = short-term.

5. Sensitivity analyses

We computed and present benefit-cost summary measures based on the sensitivity analyses described below.

a. Use alternative values for parameters derived from the literature

We conducted sensitivity analyses to assess how the estimated net benefits respond to changes in key parameter assumptions drawn from the literature, particularly those subject to uncertainty. We focused on parameters that materially influence net benefit estimates across all major perspectives. Specifically, we assessed the sensitivity of net benefit estimates to the following:

- **Excluding fringe benefits.** Because not all enrollees had jobs with fringe benefits, we examined the implications of conservatively assuming enrollees did not receive any fringe benefits.
- **Excluding SSI and SSDI application costs.** Processing initial SSI and SSDI claims may involve substantial fixed costs—such as establishing administrative systems—that could reduce the per-application cost relative to our initial estimates. To assess the implications for net benefits, we conducted a conservative analysis assuming zero application costs for both SSI and SSDI.
- **Using a fixed annual cost of $1,787 for work- and childcare-related expenses** (Congressional Research Service 2024a). Work- and childcare-related expenses might more closely reflect fixed rather than proportional costs. To reflect this possibility, in the sensitivity analysis we multiplied the fixed cost of $1,878 by impacts on employment in any of the four quarters and by the average proportion of the year employed among those ever employed.

b. Use only statistically significant impact estimates

The benchmark benefit-cost calculations incorporated all impact estimates, regardless of statistical significance. To understand the extent to which the estimated net benefits are driven by statistically nonsignificant impact estimates, we recalculated the net benefits using only impact estimates statistically significant at the 10 percent level, setting nonsignificant impact estimates equal to zero.

c. Account for uncertainty around estimated program impacts

The estimate of the net benefit relied on the estimated impacts on enrollee outcomes during the period of evaluation. These estimated impacts were subject to uncertainty and might be imprecisely estimated in the impact study. Different sampling draws would likely yield slightly different estimates, which were reflected in the standard errors that accompany the impact point estimates. To assess the extent to which random sampling error could affect the results, we followed an approach similar to that in McConnell et al. (2006) and calculated the net benefits under the alternative assumptions that the earnings impact was 1.96 standard errors above the point estimate or 1.96 standard errors below it. These points mark the ends of an approximate 95 percent confidence interval. We focused on the earnings impact, as that is the outcome for which we anticipate finding the most meaningful (that is, substantial in magnitude and statistically significant) impact.

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Appendix C.

RETAINWOR*KS*: Participation, Impact, and Benefit-Cost Analysis Results

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A. Participation analysis results

In this section, we present findings from the participation analysis of RETAINWOR*KS*. We present descriptive statistics on the rates of service use by treatment enrollees (Exhibit C.1) and rates of use of four service categories broken out by treatment enrollee characteristics (Exhibit C.2).

Exhibit C.1. RETAINWOR*KS*: Use of services by treatment enrollees

Service	Percentage (unless noted otherwise)
RETAIN services	
Used any services other than RTW plan	99.6
Used any employment services[a]	59.1
Average duration of services (days)	120.6
RTW coordinator services	
RTW plan	
RTW plan meeting with medical provider	79.2
RTW plan meeting with employer	21.2
RTW plan meeting with another party	7.9
RTW plan established	39.3
Average time elapsed between enrollment and established RTW plan (days)	56.9
RTW communications	
Two or more RTW coordinator communications with enrollee	99.2
RTW coordinator communications with enrollee (mean number)	19.1
Share of enrollees with the following number of communications:	
0-1	0.8
2-5	6.9
6-10	20.0
11-20	38.9
21+	33.4
RTW coordinator communications with employer (mean number)	0.5
Share of enrollees with the following number of communications:	
0	50.1
1	48.5
2+	1.4
RTW coordinator communications with medical provider (mean number)	5.1
Share of enrollees with the following number of communications:	
0	1.6
1	9.0
2+	89.4
RTW coordinator communications with workforce professional (mean number)	10.5

Service	Percentage (unless noted otherwise)
Share of enrollees with the following number of communications:	
0	1.0
1	4.5
2-5	28.3
6-10	66.2
Job retention services or referrals	
Any job retention services or referrals	52.7
On-site job analysis services or referrals	0.6
Ergonomic assessment services or referrals	2.0
Assistance to employer to identify or implement workplace accommodations[b]	52.5
Job search or training services or referrals	
Any job search or training services or referrals	20.6
Job search services or referrals	20.4
Job training services or referrals	1.8
Transitional work opportunity	s
Other employment-related services and supports	
Other employment services	1.2
Referral to employment-related supports	0.0

Source: RETAINWOR*KS* service use data.

[a] The percentage of treatment enrollees who received any employment services includes enrollees who used or were referred to one or more of the following: job retention services, job training and job search services, or other employment services.

[b] RETAINWOR*KS* provided employers with assessment and consultation on workplace accommodations (Keith et al. 2024).

RTW = return to work; s = cell suppressed because it represents fewer than three people.

Exhibit C.2. RETAINWOR*KS*: Services used by treatment enrollees, by characteristics at the time of enrollment

Variable	RTW plan established	Two or more RTW coordinator communications with enrollee	Any services or referrals to support job retention	Any services or referrals to job search or training
Demographic and health characteristics				
Younger than 50				
Yes	36.5	99.1	52.9	20.9
No	45.0	99.4	52.1	20.1
Difference	-8.5*	-0.3	0.9	0.8
Male				
Yes	45.3	98.5	52.2	21.9
No	35.4	99.7	52.9	19.8
Difference	9.9**	-1.2	-0.7	2.1
Primary diagnosis is musculoskeletal				
Yes	40.6	99.4	55.2	20.0
No	36.9	98.9	48.0	21.8
Difference	3.7	0.5	7.1	-1.8
Primary or secondary behavioral health condition				
Yes	38.3	99.6	53.9	22.3
No	40.3	98.8	51.4	19.0
Difference	-2.0	0.8	2.5	3.3
High school education or less				
Yes	41.0	99.6	52.2	20.5
No	37.3	98.8	53.1	20.7
Difference	3.7	0.9	-0.9	-0.2
Employment and economic circumstances				
Worked within one week of enrollment				
Yes	40.8	99.2	52.5	17.0
No	37.7	99.2	52.9	24.6
Difference	3.0	0.1	-0.4	-7.6**
Reported dissatisfaction or conflict with current job or employer				
Yes	48.6	98.6	45.8	33.3
No	37.8	99.3	53.8	18.5
Difference	10.9*	-0.7	-7.9	14.8**
Reported problems related to housing and economic circumstances				
Yes	34.5	99.1	57.2	29.7
No	43.2	99.3	48.9	13.2
Difference	-8.7**	-0.2	8.3*	16.5***

Source: RETAINWOR*KS* service use data.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

GED = General education degree; n.a. = not applicable; RTW = return to work; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

B. Impact analysis results

In this section, we present findings from the impact analysis of RETAINWOR*KS*. First, we present impacts for all enrollee outcomes as estimated through the main models described in Appendix B. For each outcome measure, we report the estimated regression-adjusted impact; the control group mean (weighted, as applicable); and additional inference statistics, such as standard errors, effect sizes, and sample sizes by treatment status. Second, we present impacts for key subgroups of evaluation enrollees. Third, we present the results of sensitivity analyses. Finally, we present results from the supplementary Bayesian analysis.

1. Results from the impact analysis

Exhibit C.3. RETAINWOR*KS*: One-year impacts on enrollee outcomes (percentage unless otherwise noted)

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Primary outcomes (one-tailed test)							
Employed in the fourth quarter after enrollment	69.3	7.9^^^	0.00	2.6	0.246	503	448
Earnings in Quarters 1–4 after enrollment ($)	29,469	3,551^^^	0.00	1,081	0.126	503	448
Applied for SSDI or SSI	15.3	-5.2^^^	0.01	2.2	-0.288	503	448
Labor force attachment and employment (two-tailed test)							
Employment and earnings in the four quarters after enrollment							
Ever employed in							
Quarter 1	76.2	6.6***	0.00	2.3	0.249	503	448
Quarter 2	74.9	6.4***	0.01	2.4	0.228	503	448
Quarter 3	72.3	6.6***	0.01	2.5	0.218	503	448
Quarter 4	69.3	7.9***	0.00	2.6	0.246	503	448
Quarters 1–4	82.9	4.9**	0.02	2.0	0.241	503	448
Earnings in quarters after enrollment							
Quarter 1 ($)	7,074	1,088***	0.00	283	0.150	503	448
Quarter 2 ($)	7,504	859***	0.01	317	0.118	503	448
Quarter 3 ($)	7,460	802**	0.01	322	0.106	503	448
Quarter 4 ($)	7,431	802**	0.02	349	0.103	503	448
Quarters 1–4	29,469	3,551***	0.00	1,081	0.126	503	448
Earned above SGA in quarters after enrollment							
Quarter 1	54.0	9.1***	0.00	2.6	0.228	503	448
Quarter 2	58.9	3.7	0.17	2.7	0.095	503	448
Quarter 3	57.1	6.7**	0.01	2.8	0.171	503	448
Quarter 4	54.5	8.4***	0.00	2.8	0.211	503	448

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Employment at the time of the survey							
Connected to an employer (currently working on or leave)	71.7	8.3***	0.01	3.0	0.276	386	344
Working	67.8	8.4***	0.01	3.2	0.253	386	344
Connected to an employer or looking for work	84.2	6.4***	0.01	2.4	0.360	386	344
Working or engaged in occasional activities or side jobs	73.2	7.6**	0.01	3.0	0.261	386	343
Participated in any job-related training	3.7	0.1	0.94	1.4	0.019	368	321
Average weekly pay ($)	614	29	0.44	37	0.049	386	344
Usual hours worked per week	25.9	2.4*	0.05	1.3	0.131	386	344
Tenured at job for at least one year	50.0	0.8	0.80	3.3	0.020	386	344
Working for an employer that offers health insurance	54.5	4.7	0.18	3.5	0.116	386	344
Working for an employer that offers paid leave	54.1	4.7	0.16	3.3	0.116	386	344
SSA program participation in the 12 months after enrollment (two-tailed test)							
Applied for SSDI or SSI	15.3	-5.2**	0.02	2.2	-0.288	503	448
Received SSI or SSDI	7.8	-1.7	0.28	1.6	-0.165	503	448
SSA payment amount (SSI or SSDI; $)	1,103	-175	0.54	282	-0.040	503	448
Applied for SSDI	14.4	-5.7***	0.01	2.1	-0.343	503	448
Received SSDI benefit	7.3	-1.9	0.20	1.5	-0.198	503	448
SSDI benefit amount ($)	1,033	-206	0.42	256	-0.051	503	448
Applied for SSI	7.7	-1.6	0.35	1.7	-0.148	503	448
Received SSI payment	1.8	-0.4	0.62	0.9	-0.172	503	448
SSI payment amount ($)	69	31	0.62	63	0.037	503	448
Household economic well-being in the month before the survey (two-tailed test)							
Household income ($)	4,162	-118	0.57	206	-0.038	376	334
Household earnings ($)	3,414	93	0.64	197	0.031	384	342
Receipt of public assistance benefits	19.5	-1.7	0.54	2.7	-0.067	387	342
UI benefit amount ($)	15	-4	0.67	10	-0.031	387	344
SNAP benefit amount ($)	77	-13	0.40	15	-0.063	387	342

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Government housing assistance amount ($)	20	-8	0.34	8	-0.067	387	343
Receipt of workers' compensation benefits	2.1	-0.2	0.83	1.0	-0.064	386	344
Workers' compensation amount ($)	33	4	0.84	20	0.015	386	344
Receipt of private short- or long-term disability payments	6.7	-2.6	0.12	1.7	-0.317	387	343
Private disability benefit amount ($)	114	-57	0.11	35	-0.126	387	343
Health at the time of the survey (two-tailed test)							
Self-reported health is at least fair	88.5	2.8	0.20	2.2	0.187	387	342
Self-reported health is good or better	54.9	4.5	0.21	3.6	0.112	387	342
Self-reported health is very good or excellent	15.1	3.3	0.25	2.8	0.142	387	342
Covered by health insurance	87.4	-0.2	0.94	2.3	-0.010	387	341
During past two months, pain interfered with work most or all the time	47.9	-6.1*	0.09	3.6	-0.150	387	342
Number of poor physical health days in past month	12.2	-1.3	0.11	0.8	-0.120	384	338
Number of poor mental health days in past month	11.5	-1.0	0.23	0.8	-0.089	382	340
Pain score (range: 0 to 10)	4.7	-0.5***	0.01	0.2	-0.189	386	337
Prescribed opioid pain relievers	19.2	0.2	0.94	3.0	0.008	384	342

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for primary outcomes is based on a one-tailed *t*-test and the *p*-value for other outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

^/^^/^^^ Impact estimate is significantly greater (in the case of employment and earnings) or less (in the case of applications for SSI or SSDI) than zero (*p*-value is less than .10/.05/.01) using a one-tailed *t*-test.

N= sample size; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance

2. Results from the subgroup analysis

Exhibit C.4. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by age (percentage unless otherwise noted)

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	72.8	6.3*	0.05	334	294	62.6	11.0**	0.01	169	154	0.39
Earnings in the four quarters after enrollment ($)	30,123	3,099**	0.02	334	294	28,141	4,552**	0.02	169	154	0.53
Applied for SSI or SSDI during the 12 months after enrollment	14.1	-4.6*	0.08	334	294	17.2	-6.0	0.11	169	154	0.76
Other outcomes											
Connected to an employer at the time of survey	74.6	8.2**	0.03	241	213	66.7	8.3*	0.09	145	131	0.99
Working at the time of survey	70.5	8.6**	0.03	241	213	63.1	7.7	0.14	145	131	0.89
Average weekly pay ($) at the time of survey	619	26	0.57	241	213	607	33	0.62	145	131	0.93
Usual hours worked per week at the time of survey	27.0	2.3	0.15	241	213	24.0	2.6	0.22	145	131	0.92
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	256	241	0.27	334	294	2,769	-1,035	0.13	169	154	0.07†
Household income in past month ($)	4,052	-17	0.95	237	205	4,351	-289	0.41	139	129	0.54
Receipt of public assistance benefits in past month	20.2	-1.7	0.64	242	211	17.8	-0.9	0.81	145	131	0.88
Number of poor physical health days in past month	11.6	-1.3	0.21	240	208	13.0	-1.2	0.42	144	130	0.95

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Number of poor mental health days in past month	12.4	-1.4	0.19	240	209	9.7	-0.2	0.87	142	131	0.50

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit C.5. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by sex (percentage unless otherwise noted)

Outcome measure	Female					Male					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	72.0	8.2**	0.01	305	279	65.1	7.5*	0.09	198	169	0.90
Earnings in the four quarters after enrollment ($)	30,134	1,878	0.13	305	279	28,327	6,284***	0.00	198	169	0.06†
Applied for SSI or SSDI during the 12 months after enrollment	15.5	-5.4**	0.04	305	279	14.9	-4.8	0.16	198	169	0.89
Other outcomes											
Connected to an employer at the time of survey	73.0	7.8**	0.03	238	228	69.4	9.2*	0.07	148	116	0.83
Working at the time of survey	69.0	7.2*	0.07	238	228	65.7	10.4*	0.05	148	116	0.63
Average weekly pay ($) at the time of survey	627	-24	0.57	238	228	586	123*	0.07	148	116	0.07†
Usual hours worked per week at the time of survey	26.0	1.8	0.22	238	228	25.6	3.5	0.12	148	116	0.54
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	679	-66	0.80	305	279	1,781	-353	0.55	198	169	0.65
Household income in past month ($)	4,080	-167	0.52	234	223	4,304	-29	0.93	142	111	0.75
Receipt of public assistance benefits in past month	22.6	-2.6	0.47	239	227	13.9	0.0	0.99	148	115	0.62
Number of poor physical health days in past month	12.1	-1.5	0.15	238	224	12.3	-1.2	0.43	146	114	0.87
Number of poor mental health days in past month	11.0	-0.3	0.77	238	225	12.3	-2.2	0.11	144	115	0.27

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit C.6. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by education (percentage unless otherwise noted)

Outcome measure	No postsecondary education					Any postsecondary education					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	68.4	11.7***	0.00	264	219	70.2	4.0	0.27	239	229	0.14
Earnings in the four quarters after enrollment ($)	28,301	3,040**	0.02	264	219	30,614	4,235**	0.01	239	229	0.57
Applied for SSI or SSDI during the 12 months after enrollment	15.5	-5.4*	0.09	264	219	15.0	-5.0*	0.08	239	229	0.92
Other outcomes											
Connected to an employer at the time of survey	71.1	7.8*	0.08	194	156	72.3	8.9**	0.03	192	188	0.85
Working at the time of survey	68.6	7.2	0.12	194	156	67.2	9.5**	0.03	192	188	0.71
Average weekly pay ($) at the time of survey	584	4	0.93	194	156	642	57	0.31	192	188	0.47
Usual hours worked per week at the time of survey	25.8	1.8	0.31	194	156	26.0	3.2*	0.08	192	188	0.58
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	715	-90	0.79	264	219	1,479	-223	0.61	239	229	0.81
Household income in past month ($)	4,041	-319	0.23	186	149	4,270	94	0.76	190	185	0.32
Receipt of public assistance benefits in past month	21.2	-0.9	0.83	195	153	18.0	-2.7	0.43	192	189	0.74
Number of poor physical health days in past month	11.2	0.0	0.98	192	154	13.1	-2.6**	0.02	192	184	0.11
Number of poor mental health days in past month	11.3	-1.0	0.41	192	153	11.6	-1.0	0.38	190	187	0.98

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 level (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit C.7. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by primary diagnosis (percentage unless otherwise noted)

Outcome measure	Musculoskeletal					Non-musculoskeletal					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	70.5	10.5***	0.00	328	306	67.0	3.1	0.53	175	142	0.21
Earnings in the four quarters after enrollment ($)	30,166	3,664***	0.01	328	306	28,056	3,374*	0.08	175	142	0.90
Applied for SSI or SSDI during the 12 months after enrollment	12.3	-3.8	0.11	328	306	21.5	-8.3*	0.05	175	142	0.35
Other outcomes											
Connected to an employer at the time of survey	77.2	3.8	0.27	254	245	59.7	17.8***	0.00	132	99	0.03††
Working at the time of survey	72.4	3.4	0.36	254	245	57.6	18.7***	0.00	132	99	0.03††
Average weekly pay ($) at the time of survey	640	4	0.93	254	245	561	75	0.24	132	99	0.37
Usual hours worked per week at the time of survey	27.2	1.0	0.51	254	245	23.0	5.5**	0.02	132	99	0.10
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	880	-172	0.56	328	306	1,582	-242	0.69	175	142	0.92
Household income in past month ($)	4,340	-205	0.40	249	243	3,778	43	0.91	127	91	0.59
Receipt of public assistance benefits in past month	18.6	0.2	0.94	255	246	21.5	-5.6	0.27	132	96	0.34
Number of poor physical health days in past month	11.9	-1.2	0.23	254	242	12.6	-1.2	0.41	130	96	0.99
Number of poor mental health days in past month	10.1	-0.5	0.61	251	243	14.3	-1.9	0.21	131	97	0.44

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test .

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit C.8. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by time since last worked (percentage unless otherwise noted)

Outcome measure	Last worked one week or less before enrollment					Last worked more than one week before enrollment					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	71.3	6.3*	0.07	262	232	67.0	9.9**	0.01	241	216	0.49
Earnings in the four quarters after enrollment ($)	31,606	2,475*	0.08	262	232	27,178	4,684***	0.00	241	216	0.29
Applied for SSI or SSDI during the 12 months after enrollment	9.9	-2.1	0.37	262	232	21.1	-8.6**	0.02	241	216	0.13
Other outcomes											
Connected to an employer at the time of survey	77.2	4.4	0.21	203	193	65.1	13.3***	0.01	183	151	0.14
Working at the time of survey	76.8	1.0	0.80	203	193	56.9	17.5***	0.00	183	151	0.01††
Average weekly pay ($) at the time of survey	697	-49	0.36	203	193	516	121**	0.01	183	151	0.02††
Usual hours worked per week at the time of survey	29.4	-0.3	0.84	203	193	21.7	5.9***	0.00	183	151	0.02††
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	837	-157	0.57	262	232	1,399	-212	0.67	241	216	0.92
Household income in past month ($)	4,192	56	0.85	197	193	4,141	-323	0.26	179	141	0.37
Receipt of public assistance benefits in past month	16.0	1.6	0.63	204	194	23.5	-5.3	0.24	183	148	0.22
Number of poor physical health days in past month	12.2	-0.4	0.71	202	192	12.3	-2.3*	0.05	182	146	0.26
Number of poor mental health days in past month	10.9	0.2	0.87	201	193	12.1	-2.2*	0.09	181	147	0.17

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAINWOR*KS*'s impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAINWOR*KS* was 73.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from sensitivity tests

Exhibit C.9. RETAINWOR*KS*: One-year impacts on enrollee outcomes, by estimation approach (percentage unless otherwise noted)

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Primary outcomes					
Employed in the fourth quarter after enrollment	7.9***	n.a.	8.1***	7.7***	n.a.
Earnings in Quarters 1–4 after enrollment	3,551***	n.a.	3,562*	3,140*	n.a.
Applied for SSDI or SSI	-5.2**	n.a.	-4.6**	-4.5**	n.a.
Labor force attachment and employment					
Employment and earnings in the four quarters after enrollment					
Ever employed in					
Quarter 1	6.6***	n.a.	6.8***	6.5***	n.a.
Quarter 2	6.4***	n.a.	6.1**	5.7**	n.a.
Quarter 3	6.6***	n.a.	7.0**	6.6**	n.a.
Quarters 1–4	4.9**	n.a.	5.1**	4.9**	n.a.
Earnings in quarters after enrollment					
Quarter 1 ($)	1,088***	n.a.	1,048**	955**	n.a.
Quarter 2 ($)	859***	n.a.	828*	733*	n.a.
Quarter 3 ($)	802**	n.a.	872*	751	n.a.
Quarter 4 ($)	802**	n.a.	815	701	n.a.
Earned above SGA in quarters after enrollment					
Quarter 1	9.1***	n.a.	9.0***	8.6***	n.a.
Quarter 2	3.7	n.a.	3.7	3.3	n.a.
Quarter 3	6.7**	n.a.	7.1**	6.7**	n.a.
Quarter 4	8.4***	n.a.	8.1**	7.7**	n.a.
Employment at the time of the survey					
Connected to an employer (currently working on or leave)	8.3***	8.2***	7.8**	8.2***	n.a.
Working	8.4***	8.2***	8.4**	8.6***	n.a.
Connected to an employer or looking for work	6.4***	6.3***	5.5**	5.7**	6.3***
Working or engaged in occasional activities or side jobs	7.6**	7.3**	7.7**	7.7**	n.a.

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Participated in job-related training	0.1	0.1	0.4	0.2	n.a.
Average weekly pay ($)	29	31	39	36	27
Usual hours worked per week	2.4*	2.4*	2.4*	2.5*	2.4*
Tenured at job for at least one year	0.8	1.3	0.2	1.3	0.9
Working for an employer that offers health insurance	4.7	4.7	4.3	4.7	4.6
Working for an employer that offers paid leave	4.7	4.7	4.2	4.6	5.3
SSA program participation					
SSDI or SSI program participation in the 12 months after enrollment					
Received SSI or SSDI	-1.7	n.a.	-1.8	-1.4	n.a.
SSA payment amount (SSI or SSDI; $)	-175	n.a.	-202	-161	n.a.
Applied for SSDI	-5.7***	n.a.	-5.1**	-5.1**	n.a.
Received SSDI benefit	-1.9	n.a.	-2.0	-1.5	n.a.
SSDI benefit amount ($)	-206	n.a.	-225	-181	n.a.
Applied for SSI	-1.6	n.a.	-1.0	-0.9	n.a.
Received SSI payment	-0.4	n.a.	-0.4	-0.5	n.a.
SSI payment amount ($)	31	n.a.	23	21	n.a.
Economic well-being in the month before the survey					
Household income ($)	-118	-102	-233	-192	n.a.
Household earnings ($)	93	104	23	39	n.a.
Receipt of public assistance benefits	-1.7	-1.6	-0.4	-0.9	n.a.
Household UI benefit amount ($)	-4	-4	-6	-7	-4
SNAP benefit amount ($)	-13	-12	-5	-7	-13
Government housing assistance amount ($)	-8	-8	-3	-2	-8
Receipt of workers' compensation benefits	-0.2	-0.2	-0.5	-0.4	n.a.
Household workers' compensation amount	4	5	-1	1	1
Receipt of short- or long-term disability payments	-2.6	-2.5	-2.2	-2.6	n.a.
Household private disability benefit amount ($)	-57	-55	-48	-55	-55

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Health at the time of the survey					
Self-reported health is at least fair	2.8	2.6	1.6	1.7	n.a.
Self-reported health is good or better	4.5	4.4	2.6	2.8	n.a.
Self-reported health is very good or excellent	3.3	3.1	3.3	3.1	n.a.
Covered by health insurance	-0.2	0.1	1.7	1.9	n.a.
During past two months, pain interfered with work most or all the time	-6.1*	-6.3*	-6.0	-6.0	n.a.
Number of poor physical health days in past month	-1.3	-1.3	-1.4	-1.4*	n.a.
Number of poor mental health days in past month	-1.0	-1.0	-1.0	-1.0	n.a.
Pain score (range: 0 to 10)	-0.5***	-0.5**	-0.5**	-0.5**	n.a.
Prescribed opioid pain relievers	0.2	0.2	0.9	1.0	n.a.

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: This table shows the impact estimates of RETAINWOR*KS*, using different modeling approaches. In the main model, we used covariate adjustment and weighted statistics to adjust for survey nonresponse; we also used multiple imputation when an outcome had a missing value conditional on the value of another variable. In the model with "No weighting for nonresponse," we followed the main model but did not apply weights for nonresponse. In the model with "No covariate adjustment," we followed the main model but did not include covariates. In the model with "Adjustment for strata only," we followed the main model but only adjusted for the characteristics based on which we stratified random assignment. In the model with "No multiple imputation," we followed the main model while excluding cases with outcomes that had a missing value conditional on the value of another variable. This resulted in our dropping between 0.3 percent to 2.8 percent of observations for these outcomes.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

n.a. = not applicable; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance.

4. Results from supplementary Bayesian analysis

Exhibit C.10. RETAINWOR*KS*: Bayesian interpretation of impacts on primary outcomes

Outcome	Control group mean	Impact: posterior mean (standard deviation)	Impact: 90 percent credible interval	Probability of favorable impact[a] (%)	Probability of large favorable impact[b] (%)	Probability of large unfavorable impact[b] (%)
Earnings in quarters 1–4 after enrollment ($)	29,469	2,034 (1,086)	(336, 3,933)	98	92	<1
Employed in the fourth quarter after enrollment (%)	82.9	1.6 (1.4)	(-0.4, 4.1)	89	15	<1
Applied for SSDI or SSI (%)	15.3	-0.8 (1.0)	(-2.6, 0.6)	80	56	6

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: This table shows the regression-adjusted means for the control group from the main analysis (the estimate of the counterfactual) and the regression-adjusted Bayesian estimates of RETAIN's impacts. Namely, for Bayesian impact estimates, we present the posterior mean (the point estimate), the standard deviation (the variability around that point estimate), which is also presented as a 90 percent credible interval (corresponding to the 5th and 95th percentiles of the posterior distribution). There is a 90 percent probability that the true impact lies within this credible interval, given the data and prior assumptions.

[a] A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI.

[b] As a threshold for a "large" impact, we used $500 for earnings (approximately the impacts many RETAIN programs need to break even within 20 years, see Section V.D.). For employment, we used 3 percentage points, and for earnings, we used 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

Exhibit C.11. RETAINWOR*KS*: Sensitivity of Bayesian estimates of the probability of favorable impacts to different prior assumptions (percentage)

Outcome measure	Main Bayesian model	Halved importance of priors
Probability of an increase in earnings in quarters 1–4 after enrollment	98	99
Probability of an increase in employment in the fourth quarter after enrollment	89	95
Probability of a decrease in applications for SSDI or SSI	80	89

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI. The sensitivity test halved the importance of literature-derived prior information.

C. Benefit-cost analysis results

1. Results from benefit-cost analysis

Exhibit C.12. RETAINWOR*KS*: Benefits and costs in the year after enrollment per treatment enrollee, by accounting perspective

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Benefit-cost summary measures				
Net benefits (benefits minus costs)	$3,075	-$8,142	$352	-$4,715
Benefit-cost ratio[a]	n.a.	0.18	n.a.	0.51
Program costs				
Personnel and labor costs				
Wages		-$5,867		-$5,867
Fringe benefits		-$1,315		-$1,315
Payments for providing services				
Enrollee stipends[b]	$178	-$178		$0
Payments for subcontractors for amounts less than 10 percent of expenditures[c]		-$26		-$26
Incentive payments for providers		-$274		-$274
Outreach costs		-$49		-$49
Other direct costs		-$2,008		-$2,008
Administrative and overhead costs		-$155		-$155
RETAIN program costs not invoiced to DOL		$0		$0
Total program costs	$178	-$9,872	$0	-$9,694
Indirect costs and benefits				
Earnings	$3,551			$3,551
Fringe benefits	$1,610			$1,610
Income and sales taxes[d]	-$927	$645	$282	$0
Payroll taxes – OASDI	-$220	$440		$220
Payroll taxes – Medicare	-$51	$103		$51
Work- and childcare-related costs	-$176			-$176
SSDI benefits	-$206	$206		$0
SSDI administrative costs		$1		$1
SSDI application costs		$39		$39
SSI benefits	$31	-$31		$0
SSI administrative costs		-$1		-$1
SSI application costs		$22		$22
Medicaid benefits	-$67	$43	$23	$0

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Household short- or long-term private disability payments	-$363			-$363
Household UI benefits	-$50		$50	$0
Household UI administrative costs		$6		$6
Household workers' compensation benefits	$12		-$12	$0
Household SNAP benefits	-$153	$153		$0
Household SNAP administrative costs		$2	$9	$11
Household public housing assistance	-$94	$94		$0
Household public housing assistance administrative costs		$8		$8
Total indirect costs and benefits	**$2,897**	**$1,730**	**$352**	**$4,979**

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: Benefits and costs that are not relevant to a perspective are indicated by a blank cell. To construct each component of the benefit-cost analysis, we used the estimated impacts on key outcomes (regardless of whether they were statistically significant), or imputation methods that combined the impact estimates with data from enrollee surveys and external sources. To construct program costs, we used data from the RETAIN grantee cost form and staff interviews. All benefits and costs are in dollars per enrollee.

[a] Calculated for all key stakeholders as total indirect costs and benefits divided by total program costs.

[b] Enrollee stipends included supportive services such as rent, transportation, or utility payments. We excluded incentive payments from these costs because they reflect evaluation-related expenses.

[c] Larger amounts are reflected in other categories.

[d] Income taxes include federal and state income taxes.

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance.

2. Results from sensitivity tests

Exhibit C.13. RETAINWOR*KS*: Sensitivity of net benefits to sampling variability and different assumptions

Assumption	Net benefits			
	RETAIN enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Sensitivity to sampling variability for earnings impact				
Main benefit-cost analysis model	$3,075	-$8,142	$352	-$4,715
Lower bound of 95% confidence interval	$812	-$8,852	$184	-$7,856
Upper bound of 95% confidence interval	$5,337	-$7,432	$521	-$1,574
Sensitivity to assumptions				
Excluding fringe benefits	$1,464	-$8,142	$352	-$6,325
Excluding SSI and SSDI application costs	$3,075	-$8,202	$352	-$4,775
Using fixed work- and childcare-related expenses	$3,170	-$8,142	$352	-$4,619
Used only statistically significant estimates in the calculation[a]	$3,964	-$8,644	$282	-$4,398

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: The inputs for the benefit-cost analysis are based on (1) program costs drawn from Federal Financial Reports, the RETAIN grantee cost form, and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. The net benefits shown in each cell represent the net benefits (benefits minus costs) in the year after enrollment, calculated using the specified assumption, by accounting perspective. Net benefits are in 2024 dollars per enrollee.

[a] This analysis assigns a value of zero to impact estimates that were not significant at the 0.10 level. The main analysis and all other sensitivity tests include impact estimates regardless of whether they were statistically significant.

SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

1. Results from cost neutrality analyses

Exhibit C.14. RETAINWOR*KS*: Impacts on annual earnings needed for cost neutrality at five, 10, and 20 years after enrollment, from all key accounting perspectives

Time frame to cost neutrality	Annual earnings impact needed for cost neutrality
Five years after enrollment	$1,469
10 years after enrollment	$826
20 years after enrollment	$530

Note: The inputs for the cost neutrality analysis are based on (1) program costs drawn from the RETAIN grantee cost form and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. We calculate the annual impact on earnings that would be needed in each future year to make the program cost neutral within the time frames indicated.

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Appendix D.

RETAIN Kentucky: Participation, Impact, and Benefit-Cost Analysis Results

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A. Participation analysis results

Exhibit D.1. RETAIN KY: Use of services by treatment enrollees

Service	Percentage (unless noted otherwise)
RETAIN services	
Used any services other than RTW plan	97.0
Used any employment services[a]	20.3
Average duration of services (days)	82.3
RTW coordinator services	
RTW plan	
RTW plan meeting with medical provider	2.6
RTW plan meeting with employer	0.4
RTW plan meeting with another party	0.0
RTW plan established	79.9
Average time elapsed between enrollment and established RTW plan (days)	6.5
RTW communications	
Two or more RTW coordinator communications with enrollee	96.9
RTW coordinator communications with enrollee (mean number)	11.3
Share of enrollees with the following number of communications:	
0-1	3.1
2-5	29.9
6-10	29.9
11-20	25.0
21+	12.1
RTW coordinator communications with employer (mean number)	0.0
Share of enrollees with the following number of communications:	
0	98.8
1	0.6
2+	0.6
RTW coordinator communications with medical provider (mean number)	0.2
Share of enrollees with the following number of communications:	
0	90.6
1	5.1
2+	4.3
RTW coordinator communications with workforce professional (mean number)	0.3
Share of enrollees with the following number of communications:	
0	88.3
1	5.3
2-5	5.0
6-10	1.4

Service	Percentage (unless noted otherwise)
Job retention services or referrals	
Any job retention services or referrals	4.1
On-site job analysis services or referrals	0.4
Ergonomic assessment services or referrals	2.1
Assistance to employer to identify or implement workplace accommodations[b]	2.5
Job search or training services or referrals	
Any job search or training services or referrals	15.4
Job search services or referrals	14.3
Job training services or referrals	2.8
Transitional work opportunity	0.7
Other employment-related services and supports	
Other employment services	5.0
Referral to employment-related supports	16.3

Source: RETAIN KY service use data.

[a] The percentage of treatment enrollees who received any employment services includes enrollees who used or were referred to one or more of the following: job retention services, job training and job search services, or other employment services.

[b] RTW coordinators supported enrollees in navigating work accommodations instead of communicating directly with employers to assist with work accommodations (Keith et al. 2024).

RTW = return to work; s = cell suppressed because it represents fewer than three people.

Exhibit D.2. RETAIN KY: Services used by treatment enrollees, by characteristics at the time of enrollment

Variable	RTW plan established	Two or more RTW coordinator communications with enrollee	Any services or referrals to support job retention	Any services or referrals to job search or training
Demographic and health characteristics				
Younger than 50				
Yes	77.6	97.1	3.2	15.9
No	85.7	96.6	6.4	14.1
Difference	-8.1***	0.5	-3.2***	1.8
Male				
Yes	77.1	96.2	3.8	15.8
No	81.6	97.4	4.3	15.2
Difference	-4.5**	-1.2	-0.5	0.6
Primary diagnosis is musculoskeletal				
Yes	79.7	97.7	4.3	12.6
No	79.9	96.6	4.0	16.4
Difference	-0.3	1.1	0.3	-3.9**
Primary or secondary behavioral health condition				
Yes	79.9	97.8	3.4	16.7
No	79.8	95.4	5.5	13.2
Difference	0.1	2.4**	-2.1*	3.5*
High school education or less				
Yes	77.3	97.2	2.5	14.5
No	83.1	96.6	6.1	16.5
Difference	-5.8***	0.6	-3.6***	-2.0
Employment and economic circumstances				
Worked within one week of enrollment				
Yes	82.7	96.2	6.3	11.6
No	77.3	97.6	2.1	18.9
Difference	5.4***	-1.4	4.2***	-7.3***
Reported dissatisfaction or conflict with current job or employer				
Yes	81.3	98.5	4.2	24.2
No	79.5	96.5	4.1	13.2
Difference	1.8	2.0**	0.1	10.9***
Reported problems related to housing and economic circumstances				
Yes	81.0	98.2	2.6	17.2
No	78.3	95.1	6.4	12.9
Difference	2.7	3.0***	-3.8***	4.3**

Source: RETAIN KY service use data.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

GED = General education degree; n.a. = not applicable; RTW = return to work; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

B. Impact analysis results

1. Results from the impact analysis

Exhibit D.3. RETAIN KY: One-year impacts on enrollee outcomes (percentage unless otherwise noted)

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Primary outcomes (one-tailed test)							
Employed in the fourth quarter after enrollment	63.0	0.6	0.35	1.6	0.017	1,591	1,447
Earnings in Quarters 1–4 after enrollment ($)	23,655	222	0.36	641	0.008	1,591	1,447
Applied for SSDI or SSI	11.2	0.6	0.69	1.1	0.034	1,591	1,447
Labor force attachment and employment (two-tailed test)							
Employment and earnings in the four quarters after enrollment							
Ever employed in							
Quarter 1	68.0	2.1	0.15	1.5	0.060	1,591	1,447
Quarter 2	67.4	1.1	0.47	1.5	0.031	1,591	1,447
Quarter 3	64.3	1.8	0.24	1.6	0.049	1,591	1,447
Quarter 4	63.0	0.6	0.69	1.6	0.017	1,591	1,447
Quarters 1–4	79.6	1.5	0.25	1.3	0.058	1,591	1,447
Earnings in quarters after enrollment							
Quarter 1 ($)	5,657	54	0.74	160	0.008	1,591	1,447
Quarter 2 ($)	5,979	52	0.78	183	0.007	1,591	1,447
Quarter 3 ($)	6,050	75	0.69	191	0.010	1,591	1,447
Quarter 4 ($)	5,969	41	0.84	209	0.006	1,591	1,447
Quarters 1–4	23,655	222	0.73	641	0.008	1,591	1,447
Earned above SGA in quarters after enrollment							
Quarter 1	44.0	1.0	0.49	1.5	0.024	1,591	1,447
Quarter 2	44.7	2.7*	0.08	1.5	0.066	1,591	1,447
Quarter 3	45.8	0.5	0.73	1.6	0.013	1,591	1,447
Quarter 4	44.2	1.9	0.23	1.6	0.047	1,591	1,447

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Employment at the time of the survey							
Connected to an employer (currently working on or leave)	66.3	2.5	0.18	1.9	0.070	1,195	1,091
Working	63.5	2.5	0.20	1.9	0.066	1,195	1,091
Connected to an employer or looking for work	85.0	2.3	0.12	1.5	0.116	1,195	1,091
Working or engaged in occasional activities or side jobs	72.4	0.1	0.95	1.8	0.003	1,192	1,085
Participated in any job-related training	7.4	1.9	0.11	1.2	0.154	1,096	997
Average weekly pay ($)	479	13	0.49	19	0.025	1,195	1,091
Usual hours worked per week	22.2	0.8	0.26	0.7	0.045	1,195	1,091
Tenured at job for at least one year	36.0	-0.2	0.92	1.7	-0.005	1,195	1,091
Working for an employer that offers health insurance	43.4	1.5	0.44	2.0	0.037	1,195	1,091
Working for an employer that offers paid leave	43.3	0.7	0.71	1.9	0.018	1,195	1,091
SSA program participation in the 12 months after enrollment (two-tailed test)							
Applied for SSDI or SSI	11.2	0.6	0.62	1.1	0.034	1,591	1,447
Received SSI or SSDI	8.9	-0.5	0.59	0.9	-0.036	1,591	1,447
SSA payment amount (SSI or SSDI; $)	1,335	-8	0.96	161	-0.002	1,591	1,447
Applied for SSDI	10.5	0.5	0.64	1.1	0.033	1,591	1,447
Received SSDI benefit	8.4	-0.4	0.66	0.8	-0.029	1,591	1,447
SSDI benefit amount ($)	1,279	-14	0.93	157	-0.003	1,591	1,447
Applied for SSI	7.1	0.0	0.99	0.9	0.001	1,591	1,447
Received SSI payment	1.6	-0.1	0.90	0.4	-0.022	1,591	1,447
SSI payment amount ($)	56	6	0.79	21	0.009	1,591	1,447
Household economic well-being in the month before the survey (two-tailed test)							
Household income ($)	3,402	77	0.50	114	0.025	1,133	1,044
Household earnings ($)	2,847	2	0.99	106	0.001	1,168	1,063
Receipt of public assistance benefits	27.9	1.3	0.48	1.8	0.039	1,186	1,082
UI benefit amount ($)	10	-1	0.83	5	-0.009	1,186	1,083
SNAP benefit amount ($)	87	9	0.27	8	0.046	1,187	1,082
Government housing assistance amount ($)	36	5	0.51	8	0.029	1,185	1,083

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Receipt of workers' compensation benefits	1.0	0.1	0.77	0.4	0.076	1,185	1,083
Workers' compensation amount ($)	9	1	0.86	7	0.008	1,185	1,083
Receipt of private short- or long-term disability payments	4.1	0.2	0.78	0.8	0.035	1,184	1,081
Private disability benefit amount ($)	63	-3	0.83	16	-0.009	1,184	1,081
Health at the time of the survey (two-tailed test)							
Self-reported health is at least fair	88.1	1.7	0.21	1.3	0.102	1,178	1,080
Self-reported health is good or better	55.4	2.5	0.24	2.1	0.061	1,178	1,080
Self-reported health is very good or excellent	17.6	-1.1	0.50	1.6	-0.046	1,178	1,080
Covered by health insurance	91.5	-0.8	0.53	1.2	-0.056	1,176	1,080
During past two months, pain interfered with work most or all the time	40.6	1.6	0.44	2.0	0.039	1,177	1,077
Number of poor physical health days in past month	10.8	0.4	0.33	0.5	0.041	1,168	1,075
Number of poor mental health days in past month	12.0	0.9**	0.04	0.5	0.085	1,167	1,071
Pain score (range: 0 to 10)	4.4	0.1	0.52	0.1	0.027	1,163	1,072
Prescribed opioid pain relievers	12.0	-0.8	0.55	1.4	-0.048	1,172	1,076

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for primary outcomes is based on a one-tailed *t*-test and the *p*-value for other outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

^/^^/^^^ Impact estimate is significantly greater (in the case of employment and earnings) or less (in the case of applications for SSI or SSDI) than zero (*p*-value is less than .10/.05/.01) using a one-tailed *t*-test.

N= sample size; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance

2. Results from the subgroup analysis

Exhibit D.4. RETAIN KY: One-year impacts on enrollee outcomes, by age (percentage unless otherwise noted)

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	63.8	1.2	0.52	1,137	1,047	61.0	-0.7	0.80	454	400	0.58
Earnings in the four quarters after enrollment ($)	23,624	725	0.31	1,137	1,047	23,718	-1,005	0.47	454	400	0.27
Applied for SSI or SSDI during the 12 months after enrollment	10.4	-0.3	0.82	1,137	1,047	13.2	2.7	0.25	454	400	0.26
Other outcomes											
Connected to an employer at the time of survey	67.9	1.5	0.50	817	766	62.2	5.1	0.13	378	325	0.39
Working at the time of survey	65.3	1.3	0.59	817	766	59.0	5.6	0.11	378	325	0.30
Average weekly pay ($) at the time of survey	502	1	0.98	817	766	421	47	0.23	378	325	0.30
Usual hours worked per week at the time of survey	23.2	0.3	0.74	817	766	19.7	2.3*	0.09	378	325	0.22
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	479	53	0.63	1,137	1,047	3,614	-331	0.55	454	400	0.50
Household income in past month ($)	3,343	78	0.56	774	737	3,568	33	0.88	359	307	0.86
Receipt of public assistance benefits in past month	28.8	0.8	0.73	808	760	25.2	3.5	0.24	378	322	0.47
Number of poor physical health days in past month	10.9	0.4	0.41	794	753	10.5	0.3	0.69	374	322	0.92

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Number of poor mental health days in past month	12.7	0.9	0.12	796	752	10.2	1.2	0.16	371	319	0.77

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit D.5. RETAIN KY: One-year impacts on enrollee outcomes, by sex (percentage unless otherwise noted)

Outcome measure	Female					Male					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	64.3	-0.2	0.91	966	905	60.9	2.0	0.44	625	542	0.50
Earnings in the four quarters after enrollment ($)	23,037	118	0.88	966	905	24,643	391	0.72	625	542	0.84
Applied for SSI or SSDI during the 12 months after enrollment	10.9	0.6	0.68	966	905	11.6	0.6	0.77	625	542	1.00
Other outcomes											
Connected to an employer at the time of survey	67.7	0.5	0.82	766	725	63.8	5.9*	0.07	429	366	0.18
Working at the time of survey	65.7	0.0	1.00	766	725	59.8	6.7**	0.05	429	366	0.11
Average weekly pay ($) at the time of survey	465	-4	0.85	766	725	500	43	0.23	429	366	0.27
Usual hours worked per week at the time of survey	22.3	-0.2	0.80	766	725	21.9	2.6*	0.05	429	366	0.08†
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,224	54	0.76	966	905	1,516	-110	0.73	625	542	0.65
Household income in past month ($)	3,443	-110	0.42	725	699	3,320	397**	0.05	408	345	0.04††
Receipt of public assistance benefits in past month	31.4	-0.3	0.91	760	719	21.9	3.9	0.20	426	363	0.27
Number of poor physical health days in past month	11.6	0.7	0.20	747	715	9.5	0.0	0.99	421	360	0.47
Number of poor mental health days in past month	12.6	1.2**	0.04	749	712	11.0	0.6	0.49	418	359	0.55

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for

RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit D.6. RETAIN KY: One-year impacts on enrollee outcomes, by education (percentage unless otherwise noted)

Outcome measure	No postsecondary education					Any postsecondary education					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	61.6	2.3	0.31	885	774	64.6	-1.2	0.58	706	673	0.27
Earnings in the four quarters after enrollment ($)	22,204	281	0.70	885	774	25,265	415	0.71	706	673	0.92
Applied for SSI or SSDI during the 12 months after enrollment	12.9	-0.2	0.90	885	774	9.3	1.3	0.40	706	673	0.51
Other outcomes											
Connected to an employer at the time of survey	62.8	4.2	0.14	608	547	69.7	1.4	0.56	587	544	0.46
Working at the time of survey	60.1	4.1	0.15	608	547	66.9	1.5	0.56	587	544	0.50
Average weekly pay ($) at the time of survey	393	35	0.13	608	547	567	0	0.99	587	544	0.38
Usual hours worked per week at the time of survey	20.7	1.7	0.11	608	547	23.7	0.2	0.88	587	544	0.29
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,384	-38	0.85	885	774	1,282	18	0.95	706	673	0.87
Household income in past month ($)	2,921	79	0.59	569	518	3,885	140	0.44	564	526	0.79
Receipt of public assistance benefits in past month	33.3	-0.1	0.97	601	543	22.3	2.2	0.34	585	539	0.52
Number of poor physical health days in past month	11.3	0.1	0.92	591	540	10.2	0.8	0.21	577	535	0.41
Number of poor mental health days in past month	12.1	1.2*	0.08	587	537	11.9	0.7	0.32	580	534	0.59

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for

RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 level (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit D.7. RETAIN KY: One-year impacts on enrollee outcomes, by primary diagnosis (percentage unless otherwise noted)

Outcome measure	Musculoskeletal					Non-musculoskeletal					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	65.7	-0.6	0.84	423	362	62.1	1.1	0.56	1,168	1,085	0.64
Earnings in the four quarters after enrollment ($)	23,179	946	0.49	423	362	23,804	-8	0.99	1,168	1,085	0.54
Applied for SSI or SSDI during the 12 months after enrollment	10.9	-0.4	0.86	423	362	11.3	0.9	0.50	1,168	1,085	0.61
Other outcomes											
Connected to an employer at the time of survey	69.1	-1.8	0.60	345	294	65.3	4.1*	0.07	850	797	0.15
Working at the time of survey	65.6	-1.4	0.70	345	294	62.8	3.9*	0.09	850	797	0.21
Average weekly pay ($) at the time of survey	477	27	0.45	345	294	479	9	0.70	850	797	0.67
Usual hours worked per week at the time of survey	23.1	-1.0	0.49	345	294	21.9	1.5*	0.08	850	797	0.13
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,359	-159	0.58	423	362	1,334	33	0.86	1,168	1,085	0.58
Household income in past month ($)	3,508	-199	0.35	330	286	3,369	172	0.20	803	758	0.14
Receipt of public assistance benefits in past month	26.4	1.1	0.74	342	293	28.4	1.5	0.51	844	789	0.93
Number of poor physical health days in past month	11.6	1.5*	0.09	337	292	10.4	0.1	0.92	831	783	0.17
Number of poor mental health days in past month	12.0	0.4	0.62	337	291	12.0	1.1**	0.05	830	780	0.51

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for

RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test .

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit D.8. RETAIN KY: One-year impacts on enrollee outcomes, by time since last worked (percentage unless otherwise noted)

Outcome measure	Last worked one week or less before enrollment					Last worked more than one week before enrollment					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	70.6	-1.2	0.59	761	704	56.0	2.3	0.34	830	743	0.28
Earnings in the four quarters after enrollment ($)	26,152	467	0.61	761	704	21,397	-131	0.89	830	743	0.64
Applied for SSI or SSDI during the 12 months after enrollment	5.4	0.6	0.62	761	704	16.5	0.6	0.75	830	743	0.99
Other outcomes											
Connected to an employer at the time of survey	74.2	-0.6	0.81	632	569	58.7	5.4*	0.07	563	522	0.11
Working at the time of survey	73.0	-0.3	0.91	632	569	54.6	5.1*	0.09	563	522	0.17
Average weekly pay ($) at the time of survey	533	5	0.85	632	569	428	20	0.45	563	522	0.71
Usual hours worked per week at the time of survey	25.7	-0.2	0.82	632	569	18.9	1.8	0.11	563	522	0.17
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	687	-218	0.24	761	704	1,936	190	0.47	830	743	0.20
Household income in past month ($)	3,511	-123	0.47	611	548	3,304	261*	0.09	522	496	0.09†
Receipt of public assistance benefits in past month	23.3	4.1*	0.07	629	564	32.2	-1.4	0.63	557	518	0.13
Number of poor physical health days in past month	9.8	0.7	0.20	621	560	11.7	0.2	0.82	547	515	0.51
Number of poor mental health days in past month	11.3	0.8	0.19	619	556	12.6	1.1	0.12	548	515	0.76

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of RETAIN KY's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for RETAIN KY was 70.1 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from sensitivity tests

Exhibit D.9. RETAIN KY: One-year impacts on enrollee outcomes, by estimation approach (percentage unless otherwise noted)

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Primary outcomes					
Employed in the fourth quarter after enrollment	0.6	n.a.	1.2	1.0	n.a.
Earnings in Quarters 1–4 after enrollment	222	n.a.	976	806	n.a.
Applied for SSDI or SSI	0.6	n.a.	0.7	0.5	n.a.
Labor force attachment and employment					
Employment and earnings in the four quarters after enrollment					
Ever employed in					
Quarter 1	2.1	n.a.	2.7	2.3	n.a.
Quarter 2	1.1	n.a.	1.7	1.3	n.a.
Quarter 3	1.8	n.a.	2.2	2.1	n.a.
Quarters 1–4	1.5	n.a.	2.0	1.7	n.a.
Earnings in quarters after enrollment					
Quarter 1 ($)	54	n.a.	235	192	n.a.
Quarter 2 ($)	52	n.a.	235	186	n.a.
Quarter 3 ($)	75	n.a.	270	228	n.a.
Quarter 4 ($)	41	n.a.	236	200	n.a.
Earned above SGA in quarters after enrollment					
Quarter 1	1.0	n.a.	2.0	1.6	n.a.
Quarter 2	2.7*	n.a.	3.6**	3.3**	n.a.
Quarter 3	0.5	n.a.	1.5	1.2	n.a.
Quarter 4	1.9	n.a.	3.0	2.7	n.a.
Employment at the time of the survey					
Connected to an employer (currently working on or leave)	2.5	2.0	3.5*	3.0	n.a.
Working	2.5	2.0	3.3	3.0	n.a.
Connected to an employer or looking for work	2.3	1.9	2.5*	2.5*	2.2

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Working or engaged in occasional activities or side jobs	0.1	0.0	0.6	0.4	n.a.
Participated in job-related training	1.9	1.7	1.7	1.8	n.a.
Average weekly pay ($)	13	13	28	21	20
Usual hours worked per week	0.8	0.7	1.3	1.1	0.8
Tenured at job for at least one year	-0.2	-0.2	1.1	0.0	-0.2
Working for an employer that offers health insurance	1.5	1.2	2.5	2.0	1.6
Working for an employer that offers paid leave	0.7	0.3	1.8	1.3	0.8
SSA program participation					
SSDI or SSI program participation in the 12 months after enrollment					
Received SSI or SSDI	-0.5	n.a.	-0.4	-0.5	n.a.
SSA payment amount (SSI or SSDI; $)	-8	n.a.	8	0	n.a.
Applied for SSDI	0.5	n.a.	0.6	0.4	n.a.
Received SSDI benefit	-0.4	n.a.	-0.4	-0.4	n.a.
SSDI benefit amount ($)	-14	n.a.	-1	-6	n.a.
Applied for SSI	0.0	n.a.	0.1	-0.1	n.a.
Received SSI payment	-0.1	n.a.	0.0	0.0	n.a.
SSI payment amount ($)	6	n.a.	9	6	n.a.
Economic well-being in the month before the survey					
Household income ($)	77	32	124	88	n.a.
Household earnings ($)	2	-34	64	28	n.a.
Receipt of public assistance benefits	1.3	1.5	0.2	0.7	n.a.
Household UI benefit amount ($)	-1	0	-1	-1	0
SNAP benefit amount ($)	9	10	5	7	9
Government housing assistance amount ($)	5	6	2	4	10
Receipt of workers' compensation benefits	0.1	0.1	0.2	0.1	n.a.
Household workers' compensation amount	1	2	2	2	3
Receipt of short- or long-term disability payments	0.2	0.0	0.4	0.2	n.a.

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Household private disability benefit amount ($)	-3	-7	0	-3	-5
Health at the time of the survey					
Self-reported health is at least fair	1.7	1.7	1.9	1.7	n.a.
Self-reported health is good or better	2.5	2.1	2.9	2.6	n.a.
Self-reported health is very good or excellent	-1.1	-1.8	-0.8	-1.1	n.a.
Covered by health insurance	-0.8	-0.9	-1.2	-1.1	n.a.
During past two months, pain interfered with work most or all the time	1.6	1.9	1.0	1.2	n.a.
Number of poor physical health days in past month	0.4	0.5	0.3	0.4	n.a.
Number of poor mental health days in past month	0.9**	0.9**	0.8*	0.9*	n.a.
Pain score (range: 0 to 10)	0.1	0.1	0.0	0.1	n.a.
Prescribed opioid pain relievers	-0.8	-0.8	-1.1	-1.0	n.a.

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: This table shows the impact estimates of RETAIN KY, using different modeling approaches. In the main model, we used covariate adjustment and weighted statistics to adjust for survey nonresponse; we also used multiple imputation when an outcome had a missing value conditional on the value of another variable. In the model with "No weighting for nonresponse," we followed the main model but did not apply weights for nonresponse. In the model with "No covariate adjustment," we followed the main model but did not include covariates. In the model with "Adjustment for strata only," we followed the main model but only adjusted for the characteristics based on which we stratified random assignment. In the model with "No multiple imputation," we followed the main model while excluding cases with outcomes that had a missing value conditional on the value of another variable. This resulted in our dropping between 0.1 percent to 2.8 percent of observations for these outcomes.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

n.a. = not applicable; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance.

4. Results from supplementary Bayesian analysis

Exhibit D.10. RETAIN KY: Bayesian interpretation of impacts on primary outcomes

Outcome	Control group mean	Impact: posterior mean (standard deviation)	Impact: 90 percent credible interval	Probability of favorable impact[a] (%)	Probability of large favorable impact[b] (%)	Probability of large unfavorable impact[b] (%)
Earnings in quarters 1–4 after enrollment ($)	23,655	242 (571)	(-694, 1,175)	66	32	9
Employed in the fourth quarter after enrollment (%)	79.6	0.8 (1.0)	(-0.7, 2.6)	80	2	<1
Applied for SSDI or SSI (%)	11.2	0.1 (0.7)	(-1.0, 1.3)	47	18	25

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: This table shows the regression-adjusted means for the control group from the main analysis (the estimate of the counterfactual) and the regression-adjusted Bayesian estimates of RETAIN's impacts. Namely, for Bayesian impact estimates, we present the posterior mean (the point estimate), the standard deviation (the variability around that point estimate), which is also presented as a 90 percent credible interval (corresponding to the 5th and 95th percentiles of the posterior distribution). There is a 90 percent probability that the true impact lies within this credible interval, given the data and prior assumptions.

[a] A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI.

[b] As a threshold for a "large" impact, we used $500 for earnings (approximately the impacts many RETAIN programs need to break even within 20 years, see Section V.D.). For employment, we used 3 percentage points, and for earnings, we used 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

Exhibit D.11. RETAIN KY: Sensitivity of Bayesian estimates of the probability of favorable impacts to different prior assumptions (percentage)

Outcome measure	Main Bayesian model	Halved importance of priors
Probability of an increase in earnings in quarters 1–4 after enrollment	66	65
Probability of an increase in employment in the fourth quarter after enrollment	80	85
Probability of a decrease in applications for SSDI or SSI	47	44

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI. The sensitivity test halved the importance of literature-derived prior information.

C. Benefit-cost analysis results

1. Results from benefit-cost analysis

Exhibit D.12. RETAIN KY: Benefits and costs in the year after enrollment per treatment enrollee, by accounting perspective

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Benefit-cost summary measures				
Net benefits (benefits minus costs)	$362	-$5,112	$18	-$4,732
Benefit-cost ratio[a]	n.a.	-0.02	n.a.	0.06
Program costs				
Personnel and labor costs				
Wages		-$2,246		-$2,246
Fringe benefits		-$644		-$644
Payments for providing services				
Enrollee stipends[b]	$0	$0		$0
Payments for subcontractors for amounts less than 10 percent of expenditures[c]		-$336		-$336
Incentive payments for providers		$0		$0
Outreach costs		-$260		-$260
Other direct costs		-$474		-$474
Administrative and overhead costs		-$1,058		-$1,058
RETAIN program costs not invoiced to DOL		$0		$0
Total program costs	**$0**	**-$5,018**	**$0**	**-$5,018**
Indirect costs and benefits				
Earnings	$222			$222
Fringe benefits	$101			$101
Income and sales taxes[d]	-$56	$42	$14	$0

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Payroll taxes – OASDI	-$14	$28		$14
Payroll taxes – Medicare	-$3	$6		$3
Work- and childcare-related costs	-$15			-$15
SSDI benefits	-$14	$14		$0
SSDI administrative costs		$0		$0
SSDI application costs		-$4		-$4
SSI benefits	$6	-$6		$0
SSI administrative costs		$0		$0
SSI application costs		$0		$0
Medicaid benefits	-$9	$7	$2	$0
Household short- or long-term private disability payments	-$22			-$22
Household UI benefits	-$13		$13	$0
Household UI administrative costs		$2		$2
Household workers' compensation benefits	$4		-$4	$0
Household SNAP benefits	$110	-$110		$0
Household SNAP administrative costs		-$1	-$7	-$8
Household public housing assistance	$66	-$66		$0
Household public housing assistance administrative costs		-$6		-$6
Total indirect costs and benefits	**$362**	**-$94**	**$18**	**$287**

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: Benefits and costs that are not relevant to a perspective are indicated by a blank cell. To construct each component of the benefit-cost analysis, we used the estimated impacts on key outcomes (regardless of whether they were statistically significant), or imputation methods that combined the impact estimates with data from enrollee surveys and external sources. To construct program costs, we used data from the RETAIN grantee cost form and staff interviews. All benefits and costs are in dollars per enrollee.

[a] Calculated for all key stakeholders as total indirect costs and benefits divided by total program costs.

[b] Enrollee stipends included supportive services such as rent, transportation, or utility payments. We excluded incentive payments from these costs because they reflect evaluation-related expenses.

[c] Larger amounts are reflected in other categories.

[d] Income taxes include federal and state income taxes.

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance

2. Results from sensitivity tests

Exhibit D.13. RETAIN KY: Sensitivity of net benefits to sampling variability and different assumptions

Assumption	Net benefits			
	RETAIN enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Sensitivity to sampling variability for earnings impact				
Main benefit-cost analysis model	$362	-$5,112	$18	-$4,732
Lower bound of 95% confidence interval	-$965	-$5,543	-$63	-$6,570
Upper bound of 95% confidence interval	$1,689	-$4,682	$100	-$2,893
Sensitivity to assumptions				
Excluding fringe benefits	$1,689	-$4,682	$100	-$2,893
Excluding SSI and SSDI application costs				
Using fixed work- and childcare-related expenses	$262	-$5,112	$18	-$4,832
Used only statistically significant estimates in the calculation[a]	$0	-$5,018	$0	-$5,018

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: The inputs for the benefit-cost analysis are based on (1) program costs drawn from Federal Financial Reports, the RETAIN grantee cost form, and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. The net benefits shown in each cell represent the net benefits (benefits minus costs) in the year after enrollment, calculated using the specified assumption, by accounting perspective. Net benefits are in 2024 dollars per enrollee.

[a] This analysis assigns a value of zero to impact estimates that were not significant at the 0.10 level. The main analysis and all other sensitivity tests include impact estimates regardless of whether they were statistically significant.

SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from cost neutrality analyses

Exhibit D.14. RETAIN KY: Impacts on annual earnings needed for cost neutrality at five, 10, and 20 years after enrollment, from all key accounting perspectives

Time frame to cost neutrality	Annual earnings impact needed for cost neutrality
Five years after enrollment	$774
10 years after enrollment	$435
20 years after enrollment	$279

Note: The inputs for cost neutrality are based on (1) program costs drawn from the RETAIN grantee cost form and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. We calculate the annual impact on earnings that would be needed in each future year to make the program cost neutral within the time frames indicated.

Appendix E.

Minnesota RETAIN: Participation, Impact, and Benefit-Cost Analysis Results

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A. Participation analysis results

Exhibit E.1. MN RETAIN: Use of services by treatment enrollees

Service	Percentage (unless noted otherwise)
RETAIN services	
Used any services other than RTW plan	100.0
Used any employment services[a]	99.9
Average duration of services (days)	102.4
RTW coordinator services	
RTW plan	
RTW plan meeting with medical provider	0.0
RTW plan meeting with employer	0.0
RTW plan meeting with another party	0.0
RTW plan established	96.9
Average time elapsed between enrollment and established RTW plan (days)	2.5
RTW communications	
Two or more RTW coordinator communications with enrollee	100.0
RTW coordinator communications with enrollee (mean number)	20.3
Share of enrollees with the following number of communications:	
0-1	0.0
2-5	5.6
6-10	24.9
11-20	30.8
21+	38.7
RTW coordinator communications with employer (mean number)	0.4
Share of enrollees with the following number of communications:	
0	73.5
1	18.8
2+	7.6
RTW coordinator communications with medical provider (mean number)	1.1
Share of enrollees with the following number of communications:	
0	4.6
1	87.2
2+	8.2
RTW coordinator communications with workforce professional (mean number)	2.0
Share of enrollees with the following number of communications:	
0	37.5
1	8.1
2-5	47.4
6-10	7.0

Service	Percentage (unless noted otherwise)
Job retention services or referrals	
Any job retention services or referrals	s
On-site job analysis services or referrals	0.0
Ergonomic assessment services or referrals	0.0
Assistance to employer to identify or implement workplace accommodations[b]	s
Job search or training services or referrals	
Any job search or training services or referrals	s
Job search services or referrals	s
Job training services or referrals	s
Transitional work opportunity	0.0
Other employment-related services and supports	
Other employment services	99.9
Referral to employment-related supports	0.0

Source: RETAIN service use data.

[a] The percentage of treatment enrollees who received any employment services includes enrollees who used or were referred to one or more of the following: job retention services, job training and job search services, or other employment services.

[b] RTW coordinators supported enrollees in navigating work accommodations instead of communicating directly with employers to assist with work accommodations (Keith et al. 2024).

RTW = return to work; s = cell suppressed because it represents fewer than three people.

Exhibit E.2. MN RETAIN: Services used by treatment enrollees, by characteristics at the time of enrollment

Variable	RTW plan established	Two or more RTW coordinator communications with enrollee	Any services or referrals to support job retention	Any services or referrals to job search or training
Demographic and health characteristics				
Younger than 50				
Yes	96.7	100.0	s	s
No	97.3	100.0	0.0	0.0
Difference	-0.7	0.0	s	s
Male				
Yes	96.5	100.0	0.0	s
No	97.2	100.0	s	s
Difference	-0.6	0.0	s	s
Primary diagnosis is musculoskeletal				
Yes	96.9	100.0	0.0	s
No	96.8	100.0	s	s
Difference	0.1	0.0	s	s
Primary or secondary behavioral health condition				
Yes	96.9	100.0	s	s
No	96.8	100.0	0.0	s
Difference	0.1	0.0	s	s
High school education or less				
Yes	96.3	100.0	0.0	s
No	97.3	100.0	s	0.0
Difference	-1.0	0.0	s	s
Employment and economic circumstances				
Worked within one week of enrollment				
Yes	96.9	100.0	s	s
No	96.8	100.0	0.0	s
Difference	0.1	0.0	s	s
Reported dissatisfaction or conflict with current job or employer				
Yes	96.9	100.0	0.0	s
No	96.9	100.0	s	s
Difference	0.0	0.0	s	s
Reported problems related to housing and economic circumstances				
Yes	97.8	100.0	0.0	s
No	96.5	100.0	s	s
Difference	1.3	0.0	s	s

Source: RETAIN service use data.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

GED = General education degree; n.a. = not applicable; RTW = return to work; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

B. Impact analysis results

1. Results from the impact analysis

Exhibit E.3. MN RETAIN: One-year impacts on enrollee outcomes (percentage unless otherwise noted)

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Primary outcomes (one-tailed test)							
Employed in the fourth quarter after enrollment	67.7	-0.6	0.67	1.5	-0.017	1,567	1,572
Earnings in Quarters 1–4 after enrollment ($)	36,847	241	0.38	809	0.006	1,567	1,572
Applied for SSDI or SSI	9.5	-0.7	0.25	1.0	-0.050	1,567	1,572
Labor force attachment and employment (two-tailed test)							
Employment and earnings in the four quarters after enrollment							
Ever employed in							
Quarter 1	72.9	-2.6*	0.05	1.3	-0.077	1,567	1,572
Quarter 2	71.7	-2.0	0.15	1.4	-0.059	1,567	1,572
Quarter 3	70.0	-1.1	0.42	1.4	-0.033	1,567	1,572
Quarter 4	67.7	-0.6	0.67	1.5	-0.017	1,567	1,572
Quarters 1–4	80.6	-0.6	0.62	1.2	-0.023	1,567	1,572
Earnings in quarters after enrollment							
Quarter 1 ($)	8,697	84	0.71	222	0.008	1,567	1,572
Quarter 2 ($)	9,463	-260	0.26	232	-0.024	1,567	1,572
Quarter 3 ($)	9,451	60	0.80	239	0.005	1,567	1,572
Quarter 4 ($)	9,236	356	0.17	259	0.032	1,567	1,572
Quarters 1–4	36,847	241	0.77	809	0.006	1,567	1,572
Earned above SGA in quarters after enrollment							
Quarter 1	53.9	-2.0	0.16	1.4	-0.049	1,567	1,572
Quarter 2	56.6	-3.2**	0.03	1.5	-0.077	1,567	1,572
Quarter 3	56.1	-2.4	0.11	1.5	-0.058	1,567	1,572
Quarter 4	54.6	-0.9	0.53	1.5	-0.023	1,567	1,572

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Employment at the time of the survey							
Connected to an employer (currently working on or leave)	73.7	-0.3	0.87	1.7	-0.009	1,193	1,167
Working	69.1	0.8	0.65	1.8	0.023	1,193	1,167
Connected to an employer or looking for work	88.4	-0.8	0.53	1.3	-0.048	1,193	1,167
Working or engaged in occasional activities or side jobs	73.9	0.8	0.64	1.8	0.026	1,188	1,164
Participated in any job-related training	5.5	1.4	0.19	1.1	0.150	1,013	1,018
Average weekly pay ($)	763	6	0.83	27	0.007	1,193	1,167
Usual hours worked per week	24.6	0.5	0.46	0.7	0.028	1,193	1,167
Tenured at job for at least one year	47.3	0.0	0.99	1.8	-0.001	1,193	1,167
Working for an employer that offers health insurance	48.7	-0.2	0.91	1.9	-0.005	1,193	1,167
Working for an employer that offers paid leave	52.4	-0.2	0.91	1.9	-0.005	1,193	1,167
SSA program participation in the 12 months after enrollment (two-tailed test)							
Applied for SSDI or SSI	9.5	-0.7	0.49	1.0	-0.050	1,567	1,572
Received SSI or SSDI	6.9	-0.5	0.57	0.8	-0.047	1,567	1,572
SSA payment amount (SSI or SSDI; $)	1,104	5	0.98	174	0.001	1,567	1,572
Applied for SSDI	8.9	-1.0	0.29	1.0	-0.081	1,567	1,572
Received SSDI benefit	6.2	-0.1	0.92	0.8	-0.009	1,567	1,572
SSDI benefit amount ($)	1,058	3	0.98	169	0.001	1,567	1,572
Applied for SSI	4.3	-0.8	0.25	0.7	-0.125	1,567	1,572
Received SSI payment	1.0	-0.1	0.83	0.4	-0.049	1,567	1,572
SSI payment amount ($)	46	2	0.95	31	0.003	1,567	1,572
Household economic well-being in the month before the survey (two-tailed test)							
Household income ($)	5,546	-102	0.57	179	-0.021	1,138	1,110
Household earnings ($)	4,888	-53	0.76	175	-0.011	1,163	1,140
Receipt of public assistance benefits	23.1	0.2	0.89	1.6	0.008	1,182	1,158
UI benefit amount ($)	36	5	0.63	11	0.021	1,184	1,160
SNAP benefit amount ($)	60	1	0.82	6	0.009	1,186	1,159
Government housing assistance amount ($)	36	7	0.45	9	0.033	1,184	1,163

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Receipt of workers' compensation benefits	1.4	0.0	0.95	0.5	0.014	1,186	1,158
Workers' compensation amount ($)	22	-5	0.60	9	-0.022	1,186	1,158
Receipt of private short- or long-term disability payments	4.9	0.1	0.91	0.9	0.012	1,184	1,159
Private disability benefit amount ($)	88	15	0.52	23	0.026	1,184	1,159
Health at the time of the survey (two-tailed test)							
Self-reported health is at least fair	90.8	2.1*	0.06	1.1	0.172	1,176	1,157
Self-reported health is good or better	62.4	1.7	0.37	1.9	0.045	1,176	1,157
Self-reported health is very good or excellent	26.0	-1.3	0.45	1.8	-0.043	1,176	1,157
Covered by health insurance	93.0	1.4	0.17	1.0	0.149	1,175	1,157
During past two months, pain interfered with work most or all the time	38.4	-3.3*	0.09	2.0	-0.087	1,175	1,153
Number of poor physical health days in past month	10.2	-0.3	0.47	0.4	-0.029	1,173	1,151
Number of poor mental health days in past month	11.3	-1.0**	0.03	0.4	-0.089	1,174	1,150
Pain score (range: 0 to 10)	3.9	-0.2	0.13	0.1	-0.061	1,169	1,152
Prescribed opioid pain relievers	11.0	-1.4	0.26	1.3	-0.094	1,175	1,153

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for primary outcomes is based on a one-tailed *t*-test and the *p*-value for other outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

^/^^/^^^ Impact estimate is significantly greater (in the case of employment and earnings) or less (in the case of applications for SSI or SSDI) than zero (*p*-value is less than .10/.05/.01) using a one-tailed *t*-test.

N= sample size; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance

2. Results from the subgroup analysis

Exhibit E.4. MN RETAIN: One-year impacts on enrollee outcomes, by age (percentage unless otherwise noted)

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	69.3	-0.8	0.63	1,052	1,061	64.4	0.0	1.00	515	511	0.79
Earnings in the four quarters after enrollment ($)	37,923	-400	0.67	1,052	1,061	34,579	1,651	0.28	515	511	0.25
Applied for SSI or SSDI during the 12 months after enrollment	8.6	-1.6	0.15	1,052	1,061	11.1	1.4	0.49	515	511	0.19
Other outcomes											
Connected to an employer at the time of survey	74.8	-0.8	0.71	743	740	71.7	0.8	0.78	450	427	0.65
Working at the time of survey	71.0	-0.5	0.83	743	740	65.5	3.5	0.24	450	427	0.29
Average weekly pay ($) at the time of survey	765	10	0.75	743	740	758	-1	0.98	450	427	0.85
Usual hours worked per week at the time of survey	25.0	0.4	0.65	743	740	23.7	0.9	0.47	450	427	0.75
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	561	37	0.82	1,052	1,061	2,276	-165	0.69	515	511	0.65
Household income in past month ($)	5,383	16	0.94	709	707	5,872	-349	0.25	429	403	0.33
Receipt of public assistance benefits in past month	25.7	-0.3	0.91	738	734	18.0	1.3	0.59	444	424	0.63
Number of poor physical health days in past month	9.6	0.0	0.98	733	734	11.3	-0.9	0.27	440	417	0.37
Number of poor mental health days in past month	11.9	-1.1*	0.05	732	733	10.1	-0.8	0.29	442	417	0.74

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit E.5. MN RETAIN: One-year impacts on enrollee outcomes, by sex (percentage unless otherwise noted)

Outcome measure	Female					Male					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	69.7	0.0	0.98	863	871	65.2	-1.3	0.54	704	701	0.66
Earnings in the four quarters after enrollment ($)	37,134	-724	0.49	863	871	36,488	1,429	0.26	704	701	0.19
Applied for SSI or SSDI during the 12 months after enrollment	8.9	0.1	0.92	863	871	10.2	-1.7	0.26	704	701	0.36
Other outcomes											
Connected to an employer at the time of survey	75.6	-0.9	0.70	701	677	71.3	0.5	0.86	492	490	0.70
Working at the time of survey	70.2	0.6	0.80	701	677	67.8	1.1	0.70	492	490	0.89
Average weekly pay ($) at the time of survey	737	-6	0.85	701	677	798	22	0.63	492	490	0.62
Usual hours worked per week at the time of survey	24.0	0.7	0.46	701	677	25.4	0.4	0.75	492	490	0.84
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	930	139	0.54	863	871	1,319	-159	0.56	704	701	0.40
Household income in past month ($)	5,304	7	0.98	665	647	5,868	-247	0.37	473	463	0.48
Receipt of public assistance benefits in past month	22.6	1.0	0.62	692	673	23.7	-0.9	0.74	490	485	0.57
Number of poor physical health days in past month	10.5	0.3	0.54	689	672	9.8	-1.2*	0.08	484	479	0.08†
Number of poor mental health days in past month	11.8	-0.6	0.29	690	671	10.6	-1.5**	0.03	484	479	0.33

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit E.6. MN RETAIN: One-year impacts on enrollee outcomes, by education (percentage unless otherwise noted)

Outcome measure	No postsecondary education					Any postsecondary education					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	68.9	-5.5**	0.02	653	647	66.9	2.8	0.12	914	925	0.01†††
Earnings in the four quarters after enrollment ($)	34,408	-178	0.87	653	647	38,572	537	0.64	914	925	0.65
Applied for SSI or SSDI during the 12 months after enrollment	9.8	-0.5	0.74	653	647	9.2	-0.8	0.53	914	925	0.90
Other outcomes											
Connected to an employer at the time of survey	69.8	-0.5	0.88	436	426	76.2	-0.2	0.94	757	741	0.93
Working at the time of survey	64.6	-0.2	0.95	436	426	72.0	1.5	0.49	757	741	0.67
Average weekly pay ($) at the time of survey	637	43	0.28	436	426	842	-18	0.64	757	741	0.28
Usual hours worked per week at the time of survey	23.4	0.7	0.56	436	426	25.3	0.4	0.63	757	741	0.84
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	979	-5	0.98	653	647	1,192	12	0.96	914	925	0.96
Household income in past month ($)	4,616	366	0.16	408	403	6,123	-401*	0.09	730	707	0.03††
Receipt of public assistance benefits in past month	25.9	2.3	0.46	430	421	21.3	-1.0	0.58	752	737	0.36
Number of poor physical health days in past month	10.8	-0.1	0.85	427	418	9.8	-0.4	0.43	746	733	0.76
Number of poor mental health days in past month	11.8	-1.0	0.20	428	417	11.0	-1.0*	0.07	746	733	1.00

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 level (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit E.7. MN RETAIN: One-year impacts on enrollee outcomes, by primary diagnosis (percentage unless otherwise noted)

Outcome measure	Musculoskeletal					Non-musculoskeletal					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	70.1	0.8	0.66	950	934	64.1	-2.7	0.28	617	638	0.26
Earnings in the four quarters after enrollment ($)	37,788	743	0.45	950	934	35,485	-637	0.64	617	638	0.42
Applied for SSI or SSDI during the 12 months after enrollment	7.6	-0.3	0.81	950	934	12.1	-1.1	0.54	617	638	0.69
Other outcomes											
Connected to an employer at the time of survey	76.5	-1.4	0.49	723	731	69.5	1.4	0.65	470	436	0.45
Working at the time of survey	72.3	-0.4	0.87	723	731	64.4	2.4	0.44	470	436	0.47
Average weekly pay ($) at the time of survey	798	9	0.81	723	731	710	-1	0.98	470	436	0.86
Usual hours worked per week at the time of survey	26.0	0.3	0.73	723	731	22.4	0.8	0.51	470	436	0.75
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,001	-46	0.82	950	934	1,252	95	0.77	617	638	0.71
Household income in past month ($)	5,615	62	0.79	695	696	5,456	-388	0.15	443	414	0.20
Receipt of public assistance benefits in past month	22.2	0.1	0.95	720	726	24.3	0.8	0.79	462	432	0.86
Number of poor physical health days in past month	9.8	-0.3	0.55	712	718	10.8	-0.2	0.75	461	433	0.92
Number of poor mental health days in past month	10.4	-0.8	0.15	714	717	12.5	-1.1	0.14	460	433	0.72

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test .

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit E.8. MN RETAIN: One-year impacts on enrollee outcomes, by time since last worked (percentage unless otherwise noted)

Outcome measure	Last worked one week or less before enrollment					Last worked more than one week before enrollment					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	73.7	-1.5	0.44	646	643	63.7	-0.3	0.87	921	929	0.69
Earnings in the four quarters after enrollment ($)	43,358	-1,517	0.21	646	643	32,276	1,542	0.15	921	929	0.06†
Applied for SSI or SSDI during the 12 months after enrollment	5.0	0.4	0.70	646	643	12.5	-1.4	0.37	921	929	0.35
Other outcomes											
Connected to an employer at the time of survey	78.1	1.3	0.56	517	505	70.9	-2.0	0.42	676	662	0.32
Working at the time of survey	75.1	2.1	0.38	517	505	65.1	-0.8	0.77	676	662	0.41
Average weekly pay ($) at the time of survey	891	-1	0.98	517	505	672	9	0.80	676	662	0.87
Usual hours worked per week at the time of survey	26.9	1.3	0.20	517	505	23.0	-0.3	0.79	676	662	0.27
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	559	187	0.41	646	643	1,467	-89	0.72	921	929	0.41
Household income in past month ($)	6,231	-284	0.34	500	487	5,038	32	0.89	638	623	0.39
Receipt of public assistance benefits in past month	19.5	2.9	0.19	513	504	25.6	-1.4	0.55	669	654	0.18
Number of poor physical health days in past month	8.9	0.4	0.49	510	500	11.1	-0.7	0.23	663	651	0.18
Number of poor mental health days in past month	9.7	-0.1	0.89	509	499	12.4	-1.6**	0.01	665	651	0.09†

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of MN RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for MN RETAIN was 72.4 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from sensitivity tests

Exhibit E.9. MN RETAIN: One-year impacts on enrollee outcomes, by estimation approach (percentage unless otherwise noted)

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Primary outcomes					
Employed in the fourth quarter after enrollment	-0.6	n.a.	-0.8	-0.9	n.a.
Earnings in Quarters 1–4 after enrollment	241	n.a.	-332	-505	n.a.
Applied for SSDI or SSI	-0.7	n.a.	-0.6	-0.7	n.a.
Labor force attachment and employment					
Employment and earnings in the four quarters after enrollment					
Ever employed in					
Quarter 1	-2.6*	n.a.	-2.6	-2.8**	n.a.
Quarter 2	-2.0	n.a.	-2.1	-2.3	n.a.
Quarter 3	-1.1	n.a.	-1.4	-1.4	n.a.
Quarters 1–4	-0.6	n.a.	-0.7	-0.8	n.a.
Earnings in quarters after enrollment					
Quarter 1 ($)	84	n.a.	-41	-93	n.a.
Quarter 2 ($)	-260	n.a.	-401	-442	n.a.
Quarter 3 ($)	60	n.a.	-105	-144	n.a.
Quarter 4 ($)	356	n.a.	215	174	n.a.
Earned above SGA in quarters after enrollment					
Quarter 1	-2.0	n.a.	-2.4	-2.5	n.a.
Quarter 2	-3.2**	n.a.	-3.5**	-3.6**	n.a.
Quarter 3	-2.4	n.a.	-2.8	-2.9*	n.a.
Quarter 4	-0.9	n.a.	-1.4	-1.4	n.a.
Employment at the time of the survey					
Connected to an employer (currently working on or leave)	-0.3	-0.4	-1.2	-0.6	n.a.
Working	0.8	0.7	-0.1	0.4	n.a.

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Connected to an employer or looking for work	-0.8	-0.9	-1.2	-0.9	-0.9
Working or engaged in occasional activities or side jobs	0.8	0.5	0.1	0.6	n.a.
Participated in job-related training	1.4	1.5	1.4	1.5	n.a.
Average weekly pay ($)	6	2	-6	-2	3
Usual hours worked per week	0.5	0.5	0.1	0.3	0.5
Tenured at job for at least one year	0.0	-0.2	-1.0	-0.7	0.0
Working for an employer that offers health insurance	-0.2	-0.4	-0.6	-0.6	-0.3
Working for an employer that offers paid leave	-0.2	-0.3	-0.7	-0.7	-0.4
SSA program participation					
SSDI or SSI program participation in the 12 months after enrollment					
Received SSI or SSDI	-0.5	n.a.	-0.5	-0.4	n.a.
SSA payment amount (SSI or SSDI; $)	5	n.a.	-13	-2	n.a.
Applied for SSDI	-1.0	n.a.	-1.0	-1.0	n.a.
Received SSDI benefit	-0.1	n.a.	-0.2	-0.1	n.a.
SSDI benefit amount ($)	3	n.a.	-19	-6	n.a.
Applied for SSI	-0.8	n.a.	-0.7	-0.7	n.a.
Received SSI payment	-0.1	n.a.	0.0	0.0	n.a.
SSI payment amount ($)	2	n.a.	6	4	n.a.
Economic well-being in the month before the survey					
Household income ($)	-102	-99	-172	-145	n.a.
Household earnings ($)	-53	-52	-126	-106	n.a.
Receipt of public assistance benefits	0.2	0.2	1.3	0.8	n.a.
Household UI benefit amount ($)	5	5	6	5	6
SNAP benefit amount ($)	1	1	4	4	2
Government housing assistance amount ($)	7	5	11	8	9
Receipt of workers' compensation benefits	0.0	0.0	0.1	0.1	n.a.
Household workers' compensation amount	-5	-6	-4	-5	-7

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Receipt of short- or long-term disability payments	0.1	0.2	0.2	0.1	n.a.
Household private disability benefit amount ($)	15	19	17	15	18
Health at the time of the survey					
Self-reported health is at least fair	2.1*	2.1*	1.9*	2.1*	n.a.
Self-reported health is good or better	1.7	2.0	1.0	1.4	n.a.
Self-reported health is very good or excellent	-1.3	-1.4	-1.9	-1.7	n.a.
Covered by health insurance	1.4	1.4	1.6	1.5	n.a.
During past two months, pain interfered with work most or all the time	-3.3*	-3.3*	-2.6	-3.0	n.a.
Number of poor physical health days in past month	-0.3	-0.4	-0.2	-0.3	n.a.
Number of poor mental health days in past month	-1.0**	-1.0**	-0.8*	-0.9**	n.a.
Pain score (range: 0 to 10)	-0.2	-0.2*	-0.1	-0.1	n.a.
Prescribed opioid pain relievers	-1.4	-1.3	-1.3	-1.4	n.a.

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: This table shows the impact estimates of MN RETAIN, using different modeling approaches. In the main model, we used covariate adjustment and weighted statistics to adjust for survey nonresponse; we also used multiple imputation when an outcome had a missing value conditional on the value of another variable. In the model with "No weighting for nonresponse," we followed the main model but did not apply weights for nonresponse. In the model with "No covariate adjustment," we followed the main model but did not include covariates. In the model with "Adjustment for strata only," we followed the main model but only adjusted for the characteristics based on which we stratified random assignment. In the model with "No multiple imputation," we followed the main model while excluding cases with outcomes that had a missing value conditional on the value of another variable. This resulted in our dropping between 0.3 percent to 3.1 percent of observations for these outcomes.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

n.a. = not applicable; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance.

4. Results from supplementary Bayesian analysis

Exhibit E.10. MN RETAIN: Bayesian interpretation of impacts on primary outcomes

Outcome	Control group mean	Impact: posterior mean (standard deviation)	Impact: 90 percent credible interval	Probability of favorable impact[a] (%)	Probability of large favorable impact[b] (%)	Probability of large unfavorable impact[b] (%)
Earnings in quarters 1–4 after enrollment ($)	36,847	244 (654)	(-805, 1,333)	65	34	12
Employed in the fourth quarter after enrollment (%)	80.6	-0.1 (0.9)	(-1.7, 1.3)	45	<1	<1
Applied for SSDI or SSI (%)	9.5	-0.3 (0.7)	(-1.4, 0.7)	69	38	9

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: This table shows the regression-adjusted means for the control group from the main analysis (the estimate of the counterfactual) and the regression-adjusted Bayesian estimates of RETAIN's impacts. Namely, for Bayesian impact estimates, we present the posterior mean (the point estimate), the standard deviation (the variability around that point estimate), which is also presented as a 90 percent credible interval (corresponding to the 5th and 95th percentiles of the posterior distribution). There is a 90 percent probability that the true impact lies within this credible interval, given the data and prior assumptions.

[a] A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI.

[b] As a threshold for a "large" impact, we used $500 for earnings (approximately the impacts many RETAIN programs need to break even within 20 years, see Section V.D.). For employment, we used 3 percentage points, and for SSDI/SSI applications, we used 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

Exhibit E.11. MN RETAIN: Sensitivity of Bayesian estimates of the probability of favorable impacts to different prior assumptions (percentage)

Outcome measure	Main Bayesian model	Halved importance of priors
Probability of an increase in earnings in quarters 1–4 after enrollment	65	64
Probability of an increase in employment in the fourth quarter after enrollment	45	41
Probability of a decrease in applications for SSDI or SSI	69	74

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI. The sensitivity test halved the importance of literature-derived prior information.

C. Benefit-cost analysis results

1. Results from benefit-cost analysis

Exhibit E.12. MN RETAIN: Benefits and costs in the year after enrollment per treatment enrollee, by accounting perspective

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Benefit-cost summary measures				
Net benefits (benefits minus costs)	$940	-$5,015	-$24	-$4,099
Benefit-cost ratio[a]	n.a.	0.00	n.a.	0.10
Program costs				
Personnel and labor costs				
Wages		-$1,515		-$1,515
Fringe benefits		-$569		-$569
Payments for providing services				
Enrollee stipends[b]	$443	-$443		$0
Payments for subcontractors for amounts less than 10 percent of expenditures[c]		-$811		-$811
Incentive payments for providers		-$20		-$20
Outreach costs		-$24		-$24
Other direct costs		-$42		-$42
Administrative and overhead costs		-$1,573		-$1,573
RETAIN program costs not invoiced to DOL		$0		$0
Total program costs	$443	-$4,998	$0	-$4,554
Indirect costs and benefits				
Earnings	$241			$241
Fringe benefits	$109			$109
Income and sales taxes[d]	-$64	$42	$22	$0
Payroll taxes – OASDI	-$15	$30		$15
Payroll taxes – Medicare	-$3	$7		$3
Work- and childcare-related costs	-$10			-$10
SSDI benefits	$3	-$3		$0
SSDI administrative costs		$0		$0
SSDI application costs		$7		$7
SSI benefits	$2	-$2		$0
SSI administrative costs		$0		$0
SSI application costs		$11		$11
Medicaid benefits	-$11	$7	$4	$0
Household short- or long-term private disability payments	$95			$95
Household UI benefits	$64		-$64	$0

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Household UI administrative costs		-$8		-$8
Household workers' compensation benefits	-$15		$15	$0
Household SNAP benefits	$17	-$17		$0
Household SNAP administrative costs		$0	-$1	-$1
Household public housing assistance	$84	-$84		$0
Household public housing assistance administrative costs		-$7		-$7
Total indirect costs and benefits	**$497**	**-$18**	**-$24**	**$455**

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: Benefits and costs that are not relevant to a perspective are indicated by a blank cell. To construct each component of the benefit-cost analysis, we used the estimated impacts on key outcomes (regardless of whether they were statistically significant), or imputation methods that combined the impact estimates with data from enrollee surveys and external sources. To construct program costs, we used data from the RETAIN grantee cost form and staff interviews. All benefits and costs are in dollars per enrollee.

[a] Calculated for all key stakeholders as total indirect costs and benefits divided by total program costs.

[b] Enrollee stipends included supportive services such as rent, transportation, or utility payments. We excluded incentive payments from these costs because they reflect evaluation-related expenses.

[c] Larger amounts are reflected in other categories.

[d] Income taxes include federal and state income taxes.

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance.

2. Results from sensitivity tests

Exhibit E.13. MN RETAIN: Sensitivity of net benefits to sampling variability and different assumptions

Assumption	Net benefits			
	RETAIN enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Sensitivity to sampling variability for earnings impact				
Main benefit-cost analysis model	$940	-$5,015	-$24	-$4,099
Lower bound of 95% confidence interval	-$757	-$5,537	-$166	-$6,461
Upper bound of 95% confidence interval	$2,638	-$4,494	$118	-$1,738
Sensitivity to assumptions				
Excluding fringe benefits	$831	-$5,015	-$24	-$4,208
Excluding SSI and SSDI application costs	$940	-$5,033	-$24	-$4,117
Using fixed work- and childcare-related expenses	$960	-$5,015	-$24	-$4,080
Used only statistically significant estimates in the calculation[a]	$443	-$4,998	$0	-$4,554

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: The inputs for the benefit-cost analysis are based on (1) program costs drawn from Federal Financial Reports, the RETAIN grantee cost form, and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. The net benefits shown in each cell represent the net benefits (benefits minus costs) in the year after enrollment, calculated using the specified assumption, by accounting perspective. Net benefits are in 2024 dollars per enrollee.

[a] This analysis assigns a value of zero to impact estimates that were not significant at the 0.10 level. The main analysis and all other sensitivity tests include impact estimates regardless of whether they were statistically significant.

SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income

3. Results from cost neutrality analyses

Exhibit E.14. MN RETAIN: Impacts on annual earnings needed for cost neutrality at five, 10, and 20 years after enrollment, from all key accounting perspectives

Time frame to cost neutrality	Annual earnings impact needed for cost neutrality
Five years after enrollment	$644
10 years after enrollment	$358
20 years after enrollment	$227

Note: The inputs for the cost neutrality analysis are based on (1) program costs drawn from the RETAIN grantee cost form and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. We calculate the annual impact on earnings that would be needed in each future year to make the program cost neutral within the time frames indicated.

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Appendix F.

Ohio RETAIN: Participation, Impact, and Benefit-Cost Analysis Results

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A. Participation analysis results

Exhibit F.1. OH RETAIN: Use of services by treatment enrollees

Service	Percentage (unless noted otherwise)
RETAIN services	
Used any services other than RTW plan	100.0
Used any employment services[a]	14.3
Average duration of services (days)	120.1
RTW coordinator services	
RTW plan	
RTW plan meeting with medical provider	91.1
RTW plan meeting with employer	83.9
RTW plan meeting with another party	12.1
RTW plan established	96.8
Average time elapsed between enrollment and established RTW plan (days)	20.9
RTW communications	
Two or more RTW coordinator communications with enrollee	100.0
RTW coordinator communications with enrollee (mean number)	15.3
Share of enrollees with the following number of communications:	
0-1	0.0
2-5	11.4
6-10	33.2
11-20	32.0
21+	23.3
RTW coordinator communications with employer (mean number)	1.0
Share of enrollees with the following number of communications:	
0	23.1
1	65.5
2+	11.4
RTW coordinator communications with medical provider (mean number)	7.9
Share of enrollees with the following number of communications:	
0	0.0
1	0.8
2+	99.2
RTW coordinator communications with workforce professional (mean number)	0.2
Share of enrollees with the following number of communications:	
0	90.3
1	5.2
2-5	4.2
6-10	0.3

Service	Percentage (unless noted otherwise)
Job retention services or referrals	
Any job retention services or referrals[b]	0.9
On-site job analysis services or referrals	0.2
Ergonomic assessment services or referrals	0.2
Assistance to employer to identify or implement workplace accommodations	0.5
Job search or training services or referrals	
Any job search or training services or referrals	3.2
Job search services or referrals	3.1
Job training services or referrals	s
Transitional work opportunity	s
Other employment-related services and supports	
Other employment services[c]	11.7
Referral to employment-related supports	1.9

Source: RETAIN service use data.

[a] The percentage of treatment enrollees who received any employment services includes enrollees who used or were referred to one or more of the following: job retention services, job training and job search services, or other employment services.

[b] The low data on job retention service use might be due in part to OH RETAIN considering these as employer engagement activities rather than tracking them as enrollee-level services (Keith et al. 2024).

[c] Other employment services include referrals to Ohio Means Jobs, which provides services such as job search assistance. Because we are unable to identify the specific nature of the service provided, we categorize these as other employment services.

RTW = return to work; s = cell suppressed because it represents fewer than three people.

Exhibit F.2. OH RETAIN: Services used by treatment enrollees, by characteristics at the time of enrollment

Variable	RTW plan established	Two or more RTW coordinator communications with enrollee	Any services or referrals to support job retention	Any services or referrals to job search or training
Demographic and health characteristics				
Younger than 50				
Yes	95.4	99.9	0.7	4.1
No	98.9	100.0	1.1	2.0
Difference	-3.5***	-0.1	-0.4	2.1***
Male				
Yes	96.9	100.0	0.9	3.5
No	96.8	99.9	0.9	3.1
Difference	0.1	0.1	0.1	0.4
Primary diagnosis is musculoskeletal				
Yes	96.9	99.9	0.9	3.5
No	96.7	100.0	0.7	2.0
Difference	0.2	-0.1	0.3	1.6**
Primary or secondary behavioral health condition				
Yes	95.7	100.0	0.0	5.8
No	97.1	99.9	1.1	2.7
Difference	-1.4	0.1	-1.1	3.2**
High school education or less				
Yes	96.0	100.0	0.8	3.7
No	97.5	99.9	0.9	2.8
Difference	-1.5**	0.1	-0.1	0.9
Employment and economic circumstances				
Worked within one week of enrollment				
Yes	97.9	100.0	1.2	1.5
No	96.0	99.9	0.6	4.6
Difference	1.9***	0.1	0.6	-3.1***
Reported dissatisfaction or conflict with current job or employer				
Yes	100.0	100.0	0.0	7.5
No	96.7	100.0	0.9	3.1
Difference	3.3	0.0	-0.9	4.4
Reported problems related to housing and economic circumstances				
Yes	96.3	100.0	0.0	5.7
No	96.9	99.9	1.0	2.8
Difference	-0.6	0.1	-1.0	2.9**

Source: RETAIN service use data.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

GED = General education degree; n.a. = not applicable; RTW = return to work; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

B. Impact analysis results

1. Results from the impact analysis

Exhibit F.3. OH RETAIN: One-year impacts on enrollee outcomes (percentage unless otherwise noted)

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Primary outcomes (one-tailed test)							
Employed in the fourth quarter after enrollment	75.9	-0.5	0.68	1.1	-0.017	2,241	2,247
Earnings in Quarters 1–4 after enrollment ($)	39,233	-270	0.70	529	-0.007	2,241	2,247
Applied for SSDI or SSI	5.8	0.4	0.70	0.7	0.039	2,241	2,247
Labor force attachment and employment (two-tailed test)							
Employment and earnings in the four quarters after enrollment							
Ever employed in							
Quarter 1	76.6	-1.5	0.14	1.0	-0.050	2,241	2,247
Quarter 2	77.1	0.3	0.80	1.1	0.009	2,241	2,247
Quarter 3	76.3	1.2	0.28	1.1	0.040	2,241	2,247
Quarter 4	75.9	-0.5	0.64	1.1	-0.017	2,241	2,247
Quarters 1–4	84.6	-0.6	0.49	0.9	-0.029	2,241	2,247
Earnings in quarters after enrollment							
Quarter 1 ($)	8,963	-148	0.33	153	-0.016	2,241	2,247
Quarter 2 ($)	10,082	-45	0.77	157	-0.005	2,241	2,247
Quarter 3 ($)	10,169	-131	0.41	157	-0.013	2,241	2,247
Quarter 4 ($)	10,019	54	0.76	176	0.006	2,241	2,247
Quarters 1–4	39,233	-270	0.61	529	-0.007	2,241	2,247
Earned above SGA in quarters after enrollment							
Quarter 1	59.2	-1.2	0.30	1.1	-0.030	2,241	2,247
Quarter 2	63.8	0.4	0.71	1.1	0.011	2,241	2,247
Quarter 3	64.3	-0.3	0.81	1.2	-0.007	2,241	2,247
Quarter 4	64.2	-1.0	0.42	1.2	-0.025	2,241	2,247

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Employment at the time of the survey							
Connected to an employer (currently working on or leave)	79.0	0.6	0.74	1.7	0.020	1,369	1,338
Working	75.9	-0.4	0.81	1.8	-0.014	1,369	1,338
Connected to an employer or looking for work	89.3	0.4	0.77	1.3	0.024	1,369	1,338
Working or engaged in occasional activities or side jobs	78.7	-0.3	0.86	1.7	-0.011	1,369	1,338
Participated in any job-related training	3.7	1.5	0.18	1.1	0.210	1,026	1,017
Average weekly pay ($)	791	3	0.91	28	0.004	1,369	1,338
Usual hours worked per week	29.0	-0.8	0.28	0.7	-0.043	1,369	1,338
Tenured at job for at least one year	60.8	-2.1	0.25	1.9	-0.054	1,369	1,338
Working for an employer that offers health insurance	59.5	-0.1	0.96	1.9	-0.002	1,369	1,338
Working for an employer that offers paid leave	60.1	-0.3	0.89	1.9	-0.007	1,369	1,338
SSA program participation in the 12 months after enrollment (two-tailed test)							
Applied for SSDI or SSI	5.8	0.4	0.59	0.7	0.039	2,241	2,247
Received SSI or SSDI	3.5	-0.4	0.49	0.5	-0.067	2,241	2,247
SSA payment amount (SSI or SSDI; $)	475	-73	0.36	80	-0.027	2,241	2,247
Applied for SSDI	5.3	0.3	0.67	0.7	0.033	2,241	2,247
Received SSDI benefit	3.4	-0.4	0.46	0.5	-0.072	2,241	2,247
SSDI benefit amount ($)	458	-67	0.40	79	-0.025	2,241	2,247
Applied for SSI	3.3	-0.1	0.84	0.5	-0.020	2,241	2,247
Received SSI payment	0.4	-0.1	0.43	0.2	-0.253	2,241	2,247
SSI payment amount ($)	17	-6	0.44	8	-0.022	2,241	2,247
Household economic well-being in the month before the survey (two-tailed test)							
Household income ($)	5,214	-41	0.81	171	-0.009	1,303	1,286
Household earnings ($)	4,596	18	0.92	164	0.004	1,333	1,311
Receipt of public assistance benefits	17.2	2.3	0.16	1.7	0.093	1,360	1,325
UI benefit amount ($)	15	-5	0.38	5	-0.033	1,363	1,330
SNAP benefit amount ($)	70	4	0.66	8	0.019	1,361	1,333

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Government housing assistance amount ($)	15	-2	0.70	4	-0.017	1,361	1,332
Receipt of workers' compensation benefits	1.3	-0.6	0.12	0.4	-0.378	1,363	1,331
Workers' compensation amount ($)	15	-6	0.37	6	-0.033	1,363	1,331
Receipt of private short- or long-term disability payments	3.1	1.2	0.15	0.8	0.200	1,358	1,330
Private disability benefit amount ($)	64	19	0.53	31	0.034	1,358	1,330
Health at the time of the survey (two-tailed test)							
Self-reported health is at least fair	95.5	-0.8	0.44	1.0	-0.104	1,359	1,329
Self-reported health is good or better	76.0	-0.1	0.95	1.8	-0.004	1,359	1,329
Self-reported health is very good or excellent	33.8	-0.6	0.78	2.1	-0.016	1,359	1,329
Covered by health insurance	95.8	-1.6	0.11	1.0	-0.208	1,355	1,329
During past two months, pain interfered with work most or all the time	27.9	0.8	0.67	1.9	0.024	1,355	1,329
Number of poor physical health days in past month	7.3	0.1	0.88	0.4	0.007	1,351	1,323
Number of poor mental health days in past month	7.9	-0.4	0.42	0.5	-0.036	1,350	1,325
Pain score (range: 0 to 10)	3.4	0.1	0.49	0.1	0.030	1,350	1,326
Prescribed opioid pain relievers	9.3	0.6	0.63	1.3	0.043	1,354	1,328

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The p-value for primary outcomes is based on a one-tailed *t*-test and the *p*-value for other outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

^/^^/^^^ Impact estimate is significantly greater (in the case of employment and earnings) or less (in the case of applications for SSI or SSDI) than zero (*p*-value is less than .10/.05/.01) using a one-tailed *t*-test.

N= sample size; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance

2. Results from the subgroup analysis

Exhibit F.4. OH RETAIN: One-year impacts on enrollee outcomes, by age (percentage unless otherwise noted)

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	77.8	-1.1	0.46	1,337	1,346	73.0	0.2	0.92	904	901	0.58
Earnings in the four quarters after enrollment ($)	39,916	-590	0.37	1,337	1,346	38,285	70	0.94	904	901	0.55
Applied for SSI or SSDI during the 12 months after enrollment	5.0	0.2	0.84	1,337	1,346	7.1	0.5	0.63	904	901	0.79
Other outcomes											
Connected to an employer at the time of survey	79.5	-0.5	0.85	758	748	78.6	1.6	0.47	611	590	0.53
Working at the time of survey	77.2	-1.1	0.66	758	748	74.4	-0.1	0.97	611	590	0.79
Average weekly pay ($) at the time of survey	800	1	0.98	758	748	784	-6	0.91	611	590	0.91
Usual hours worked per week at the time of survey	29.5	-0.7	0.47	758	748	28.5	-1.2	0.30	611	590	0.74
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	118	-57	0.32	1,337	1,346	958	-6	0.97	904	901	0.79
Household income in past month ($)	4,973	-75	0.72	719	712	5,569	0	1.00	584	574	0.84
Receipt of public assistance benefits in past month	19.5	2.6	0.28	752	737	13.8	2.0	0.34	608	588	0.84
Number of poor physical health days in past month	6.8	0.0	0.98	745	737	8.1	0.0	0.95	606	586	0.98

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Number of poor mental health days in past month	8.7	-0.7	0.26	741	738	6.7	0.0	0.94	609	587	0.45

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit F.5. OH RETAIN: One-year impacts on enrollee outcomes, by sex (percentage unless otherwise noted)

Outcome measure	Female					Male					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	78.3	0.0	0.99	1,387	1,394	72.0	-1.3	0.47	854	853	0.58
Earnings in the four quarters after enrollment ($)	38,144	-239	0.69	1,387	1,394	41,007	-321	0.74	854	853	0.94
Applied for SSI or SSDI during the 12 months after enrollment	5.3	1.1	0.22	1,387	1,394	6.5	-0.8	0.48	854	853	0.19
Other outcomes											
Connected to an employer at the time of survey	77.6	1.6	0.47	880	867	81.6	-1.3	0.60	489	471	0.39
Working at the time of survey	74.5	0.1	0.97	880	867	78.5	-1.4	0.62	489	471	0.69
Average weekly pay ($) at the time of survey	722	-21	0.49	880	867	914	46	0.43	489	471	0.32
Usual hours worked per week at the time of survey	27.3	-0.8	0.40	880	867	32.2	-0.8	0.50	489	471	0.96
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	443	-44	0.67	1,387	1,394	526	-121	0.35	854	853	0.64
Household income in past month ($)	4,988	-122	0.54	841	837	5,618	106	0.74	462	449	0.54
Receipt of public assistance benefits in past month	19.1	2.7	0.22	876	862	13.9	1.6	0.52	484	463	0.72
Number of poor physical health days in past month	7.9	-0.2	0.71	871	857	6.3	0.6	0.41	480	466	0.38
Number of poor mental health days in past month	8.5	-0.8	0.18	872	860	6.7	0.4	0.59	478	465	0.20

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit F.6. OH RETAIN: One-year impacts on enrollee outcomes, by education (percentage unless otherwise noted)

Outcome measure	No postsecondary education					Any postsecondary education					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	77.3	-0.7	0.70	973	946	74.9	-0.4	0.76	1,268	1,301	0.91
Earnings in the four quarters after enrollment ($)	37,672	-888	0.21	973	946	40,365	272	0.72	1,268	1,301	0.26
Applied for SSI or SSDI during the 12 months after enrollment	6.9	0.5	0.71	973	946	5.0	0.2	0.75	1,268	1,301	0.88
Other outcomes											
Connected to an employer at the time of survey	76.6	-0.2	0.95	569	518	80.5	1.5	0.44	800	820	0.65
Working at the time of survey	73.5	-0.8	0.79	569	518	77.5	0.2	0.92	800	820	0.79
Average weekly pay ($) at the time of survey	679	8	0.84	569	518	861	15	0.70	800	820	0.90
Usual hours worked per week at the time of survey	28.1	-1.2	0.31	569	518	29.6	-0.3	0.71	800	820	0.56
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	398	24	0.83	973	946	530	-144	0.19	1,268	1,301	0.28
Household income in past month ($)	4,674	-32	0.88	539	490	5,539	38	0.88	764	796	0.83
Receipt of public assistance benefits in past month	22.1	3.2	0.30	562	512	14.2	0.9	0.59	798	813	0.53
Number of poor physical health days in past month	7.9	0.4	0.60	556	511	7.0	-0.2	0.67	795	812	0.50
Number of poor mental health days in past month	8.3	-0.5	0.54	557	512	7.6	-0.3	0.54	793	813	0.88

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 level (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit F.7. OH RETAIN: One-year impacts on enrollee outcomes, by primary diagnosis (percentage unless otherwise noted)

Outcome measure	Musculoskeletal					Non-musculoskeletal					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	75.4	-0.9	0.47	1,792	1,825	78.0	1.2	0.64	449	422	0.45
Earnings in the four quarters after enrollment ($)	39,279	-434	0.46	1,792	1,825	38,993	473	0.68	449	422	0.49
Applied for SSI or SSDI during the 12 months after enrollment	5.7	0.7	0.35	1,792	1,825	6.2	-1.2	0.41	449	422	0.24
Other outcomes											
Connected to an employer at the time of survey	78.2	1.7	0.36	1,096	1,092	82.2	-3.6	0.32	273	246	0.19
Working at the time of survey	75.0	0.9	0.66	1,096	1,092	79.7	-5.2	0.17	273	246	0.16
Average weekly pay ($) at the time of survey	785	27	0.42	1,096	1,092	808	-85*	0.08	273	246	0.06†
Usual hours worked per week at the time of survey	28.6	-0.3	0.70	1,096	1,092	30.8	-2.4	0.13	273	246	0.24
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	481	-69	0.45	1,792	1,825	447	-88	0.57	449	422	0.92
Household income in past month ($)	5,210	41	0.83	1,046	1,046	5,219	-370	0.29	257	240	0.30
Receipt of public assistance benefits in past month	17.5	1.9	0.30	1,087	1,080	16.0	4.2	0.28	273	245	0.59
Number of poor physical health days in past month	7.6	0.0	0.93	1,081	1,078	6.5	0.0	0.98	270	245	0.94
Number of poor mental health days in past month	7.8	-0.3	0.49	1,081	1,080	8.3	-0.9	0.40	269	245	0.63

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test .

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit F.8. OH RETAIN: One-year impacts on enrollee outcomes, by time since last worked (percentage unless otherwise noted)

Outcome measure	Last worked one week or less before enrollment					Last worked more than one week before enrollment					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	78.0	-0.7	0.62	988	989	74.1	-0.2	0.91	1,253	1,258	0.80
Earnings in the four quarters after enrollment ($)	41,702	-796	0.33	988	989	37,289	145	0.84	1,253	1,258	0.38
Applied for SSI or SSDI during the 12 months after enrollment	3.3	0.4	0.58	988	989	7.9	0.2	0.84	1,253	1,258	0.92
Other outcomes											
Connected to an employer at the time of survey	85.3	-1.4	0.48	628	616	73.9	2.6	0.31	741	722	0.22
Working at the time of survey	82.5	-2.0	0.37	628	616	70.5	1.4	0.61	741	722	0.34
Average weekly pay ($) at the time of survey	869	18	0.67	628	616	730	-7	0.86	741	722	0.67
Usual hours worked per week at the time of survey	32.2	-1.2	0.23	628	616	26.5	-0.2	0.82	741	722	0.52
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	157	132*	0.09	988	989	730	-244*	0.06	1,253	1,258	0.01††
Household income in past month ($)	5,742	-94	0.73	602	590	4,809	-2	0.99	701	696	0.79
Receipt of public assistance benefits in past month	14.4	3.8*	0.07	624	609	19.6	0.7	0.77	736	716	0.35
Number of poor physical health days in past month	6.6	0.0	0.98	618	609	7.9	0.0	0.97	733	714	0.96
Number of poor mental health days in past month	7.1	-0.4	0.53	619	609	8.5	-0.4	0.54	731	716	0.99

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of OH RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey sampling and survey item nonresponse. The response rate for the one-year follow-up survey for OH RETAIN was 76.8 percent. For outcomes measured using survey data, we weighted the statistics to adjust for survey sampling and nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from sensitivity tests

Exhibit F.9. OH RETAIN: One-year impacts on enrollee outcomes, by estimation approach (percentage unless otherwise noted)

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Primary outcomes					
Employed in the fourth quarter after enrollment	-0.5	n.a.	-1.0	-0.8	n.a.
Earnings in Quarters 1–4 after enrollment	-270	n.a.	-878	-864	n.a.
Applied for SSDI or SSI	0.4	n.a.	0.1	0.3	n.a.
Labor force attachment and employment					
Employment and earnings in the four quarters after enrollment					
Ever employed in					
Quarter 1	-1.5	n.a.	-1.8	-1.9*	n.a.
Quarter 2	0.3	n.a.	-0.1	0.0	n.a.
Quarter 3	1.2	n.a.	0.8	0.9	n.a.
Quarters 1–4	-0.6	n.a.	-0.9	-0.9	n.a.
Earnings in quarters after enrollment					
Quarter 1 ($)	-148	n.a.	-276	-288	n.a.
Quarter 2 ($)	-45	n.a.	-194	-198	n.a.
Quarter 3 ($)	-131	n.a.	-293	-285	n.a.
Quarter 4 ($)	54	n.a.	-115	-93	n.a.
Earned above SGA in quarters after enrollment					
Quarter 1	-1.2	n.a.	-1.4	-1.5	n.a.
Quarter 2	0.4	n.a.	0.1	0.0	n.a.
Quarter 3	-0.3	n.a.	-0.7	-0.7	n.a.
Quarter 4	-1.0	n.a.	-1.4	-1.3	n.a.
Employment at the time of the survey					
Connected to an employer (currently working on or leave)	0.6	0.2	1.9	1.2	n.a.
Working	-0.4	-0.8	0.9	0.3	n.a.
Connected to an employer or looking for work	0.4	0.2	1.3	0.9	0.4

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Working or engaged in occasional activities or side jobs	-0.3	-0.9	1.1	0.4	n.a.
Participated in job-related training	1.5	1.3	1.3	1.6	n.a.
Average weekly pay ($)	3	-12	29	14	-1
Usual hours worked per week	-0.8	-0.6	-0.1	-0.5	-0.8
Tenured at job for at least one year	-2.1	-0.8	-0.6	-1.5	-2.2
Working for an employer that offers health insurance	-0.1	-0.8	1.3	0.4	-0.3
Working for an employer that offers paid leave	-0.3	-0.1	1.1	0.2	-0.5
SSA program participation					
SSDI or SSI program participation in the 12 months after enrollment					
Received SSI or SSDI	-0.4	n.a.	-0.2	-0.5	n.a.
SSA payment amount (SSI or SSDI; $)	-73	n.a.	-56	-85	n.a.
Applied for SSDI	0.3	n.a.	0.1	0.3	n.a.
Received SSDI benefit	-0.4	n.a.	-0.2	-0.5	n.a.
SSDI benefit amount ($)	-67	n.a.	-48	-78	n.a.
Applied for SSI	-0.1	n.a.	-0.3	-0.2	n.a.
Received SSI payment	-0.1	n.a.	-0.2	-0.2	n.a.
SSI payment amount ($)	-6	n.a.	-8	-8	n.a.
Economic well-being in the month before the survey					
Household income ($)	-41	-105	108	26	n.a.
Household earnings ($)	18	-67	143	70	n.a.
Use of public assistance benefits	2.3	2.5*	1.1	1.9	n.a.
Household UI benefit amount ($)	-5	-7	-4	-4	-6
SNAP benefit amount ($)	4	8	-1	2	4
Government housing assistance amount ($)	-2	0	-2	-2	1
Receipt of workers' compensation benefits	-0.6	-0.6	-0.6	-0.5	n.a.
Household workers' compensation amount	-6	-7	-6	-5	-4
Receipt of short- or long-term disability payments	1.2	1.4*	0.9	1.1	n.a.

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Household private disability benefit amount ($)	19	23	18	23	20
Health at the time of the survey					
Self-reported health is at least fair	-0.8	-1.0	-0.1	-0.5	n.a.
Self-reported health is good or better	-0.1	-1.4	1.4	0.6	n.a.
Self-reported health is very good or excellent	-0.6	-0.9	1.6	0.4	n.a.
Covered by health insurance	-1.6	-1.0	-1.5	-1.6	n.a.
During past two months, pain interfered with work most or all the time	0.8	1.7	-1.1	0.1	n.a.
Number of poor physical health days in past month	0.1	0.3	-0.4	-0.1	n.a.
Number of poor mental health days in past month	-0.4	-0.3	-0.8	-0.5	n.a.
Pain score (range: 0 to 10)	0.1	0.2**	0.0	0.0	n.a.
Prescribed opioid pain relievers	0.6	0.0	0.2	0.4	n.a.

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: This table shows the impact estimates of OH RETAIN, using different modeling approaches. In the main model, we used covariate adjustment and weighted statistics to adjust for survey nonresponse; we also used multiple imputation when an outcome had a missing value conditional on the value of another variable. In the model with "No weighting for nonresponse," we followed the main model but did not apply weights for nonresponse. In the model with "No covariate adjustment," we followed the main model but did not include covariates. In the model with "Adjustment for strata only," we followed the main model but only adjusted for the characteristics based on which we stratified random assignment. In the model with "No multiple imputation," we followed the main model while excluding cases with outcomes that had a missing value conditional on the value of another variable. This resulted in our dropping between 0.2 percent to 2.9 percent of observations for these outcomes.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

n.a. = not applicable; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance.

4. Results from supplementary Bayesian analysis

Exhibit F.10. OH RETAIN: Bayesian interpretation of impacts on primary outcomes

Outcome	Control group mean	Impact: posterior mean (standard deviation)	Impact: 90 percent credible interval	Probability of favorable impact[a] (%)	Probability of large favorable impact[b] (%)	Probability of large unfavorable impact[b] (%)
Earnings in quarters 1–4 after enrollment ($)	39,233	-178 (482)	(-987, 600)	36	8	24
Employed in the fourth quarter after enrollment (%)	84.6	-0.3 (0.8)	(-1.6, 1.0)	39	<1	<1
Applied for SSDI or SSI (%)	5.8	0.1 (0.6)	(-0.7, 1.1)	42	12	23

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: This table shows the regression-adjusted means for the control group from the main analysis (the estimate of the counterfactual) and the regression-adjusted Bayesian estimates of RETAIN's impacts. Namely, for Bayesian impact estimates, we present the posterior mean (the point estimate), the standard deviation (the variability around that point estimate), which is also presented as a 90 percent credible interval (corresponding to the 5th and 95th percentiles of the posterior distribution). There is a 90 percent probability that the true impact lies within this credible interval, given the data and prior assumptions.

[a] A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI.

[b] As a threshold for a "large" impact, we used $500 for earnings (approximately the impacts many RETAIN programs need to break even within 20 years, see Section V.D.). For employment, we used 3 percentage points, and for earnings, we used 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

Exhibit F.11. OH RETAIN: Sensitivity of Bayesian estimates of the probability of favorable impacts to different prior assumptions (percentage)

Outcome measure	Main Bayesian model	Halved importance of priors
Probability of an increase in earnings in quarters 1–4 after enrollment	36	36
Probability of an increase in employment in the fourth quarter after enrollment	39	33
Probability of a decrease in applications for SSDI or SSI	42	40

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI. The sensitivity test halved the importance of literature-derived prior information.

C. Benefit-cost analysis results

1. Results from benefit-cost analysis

Exhibit F.12. OH RETAIN: Benefits and costs in the year after enrollment per treatment enrollee, by accounting perspective

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Benefit-cost summary measures				
Net benefits (benefits minus costs)	-$227	-$3,978	$62	-$4,143
Benefit-cost ratio[a]	n.a.	0.00	n.a.	-0.07
Program costs				
Personnel and labor costs				
Wages		-$1,852		-$1,852
Fringe benefits		-$367		-$367
Payments for providing services				
Enrollee stipends[b]	$93	-$93		$0
Payments for subcontractors for amounts less than 10 percent of expenditures[c]		$0		$0
Compensation to providers		-$645		-$645
Outreach costs		-$162		-$162
Other direct costs		-$475		-$475
Administrative and overhead costs		-$369		-$369
RETAIN program costs not invoiced to DOL		$0		$0
Total program costs	$93	-$3,962	$0	-$3,869
Indirect costs and benefits				
Earnings	-$270			-$270
Fringe benefits	-$122			-$122
Income and sales taxes[d]	$61	-$47	-$14	$0
Payroll taxes – OASDI	$17	-$33		-$17
Payroll taxes – Medicare	$4	-$8		-$4
Work- and childcare-related costs	$11			$11
SSDI benefits	-$67	$67		$0
SSDI administrative costs		$0		$0
SSDI application costs		-$2		-$2
SSI benefits	-$6	$6		$0
SSI administrative costs		$0		$0
SSI application costs		$1		$1
Medicaid benefits	-$19	$14	$5	$0
Household short- or long-term private disability payments	$122			$122
Household UI benefits	-$56		$56	$0

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Household UI administrative costs		$7		$7
Household workers' compensation benefits	-$17		$17	$0
Household SNAP benefits	$44	-$44		$0
Household SNAP administrative costs		$0	-$3	-$3
Household public housing assistance	-$20	$20		$0
Household public housing assistance administrative costs		$2		$2
Total indirect costs and benefits	**-$320**	**-$16**	**$62**	**-$274**

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: Benefits and costs that are not relevant to a perspective are indicated by a blank cell. To construct each component of the benefit-cost analysis, we used the estimated impacts on key outcomes (regardless of whether they were statistically significant), or imputation methods that combined the impact estimates with data from enrollee surveys and external sources. To construct program costs, we used data from the RETAIN grantee cost form and staff interviews. All benefits and costs are in dollars per enrollee.

[a] Calculated for all key stakeholders as total indirect costs and benefits divided by total program costs.

[b] Enrollee stipends included supportive services such as rent, transportation, or utility payments. We excluded incentive payments from these costs because they reflect evaluation-related expenses.

[c] Larger amounts are reflected in other categories.

[d] Income taxes include federal and state income taxes.

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance

2. Results from sensitivity tests

Exhibit F.13. OH RETAIN: Sensitivity of net benefits to sampling variability and different assumptions

Assumption	Net benefits			
	RETAIN enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Sensitivity to sampling variability for earnings impact				
Main benefit-cost analysis model	-$227	-$3,978	$62	-$4,143
Lower bound of 95% confidence interval	-$1,377	-$4,318	$10	-$5,685
Upper bound of 95% confidence interval	$923	-$3,639	$114	-$2,602
Sensitivity to assumptions				
Excluding fringe benefits	-$105	-$3,978	$62	-$4,021
Excluding SSI and SSDI application costs	-$227	-$3,978	$62	-$4,143
Using fixed work- and childcare-related expenses	-$228	-$3,978	$62	-$4,144
Used only statistically significant estimates in the calculation[a]	$93	-$3,962	$0	-$3,869

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: The inputs for the benefit-cost analysis are based on (1) program costs drawn from Federal Financial Reports, the RETAIN grantee cost form, and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. The net benefits shown in each cell represent the net benefits (benefits minus costs) in the year after enrollment, calculated using the specified assumption, by accounting perspective. Net benefits are in 2024 dollars per enrollee.

[a] This analysis assigns a value of zero to impact estimates that were not significant at the 0.10 level. The main analysis and all other sensitivity tests include impact estimates regardless of whether they were statistically significant.

SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from cost neutrality analyses

Exhibit F.14. OH RETAIN: Impacts on annual earnings needed for cost neutrality at five, 10, and 20 years after enrollment, from all key accounting perspectives

Time frame to cost neutrality	Annual earnings impact needed for cost neutrality
Five years after enrollment	$541
10 years after enrollment	$303
20 years after enrollment	$196

Note: The inputs for the cost neutrality analysis are based on (1) program costs drawn from the RETAIN grantee cost form and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. We calculate the annual impact on earnings that would be needed in each future year to make the program cost neutral within the time frames indicated.

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Appendix G.

Vermont RETAIN: Participation, Impact, and Benefit-Cost Analysis Results

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A. Participation analysis results

Exhibit G.1. VT RETAIN: Use of services by treatment enrollees

Service	Percentage (unless noted otherwise)
RETAIN services	
Used any services other than RTW plan	67.6
Used any employment services[a]	30.7
Average duration of services (days)	188.5
RTW coordinator services	
RTW plan	
RTW plan meeting with medical provider	15.8
RTW plan meeting with employer	7.1
RTW plan meeting with another party	0.9
RTW plan established	77.8
Average time elapsed between enrollment and established RTW plan (days)	31.1
RTW communications	
Two or more RTW coordinator communications with enrollee	67.1
RTW coordinator communications with enrollee (mean number)	5.3
Share of enrollees with the following number of communications:	
0-1	32.9
2-5	31.6
6-10	20.9
11-20	12.2
21+	2.4
RTW coordinator communications with employer (mean number)	0.1
Share of enrollees with the following number of communications:	
0	97.3
1	s
2+	s
RTW coordinator communications with medical provider (mean number)	2.2
Share of enrollees with the following number of communications:	
0	21.8
1	10.0
2+	68.2
RTW coordinator communications with workforce professional (mean number)	0.1
Share of enrollees with the following number of communications:	
0	92.2
1	4.4
2-5	3.3
6-10	0.0

Service	Percentage (unless noted otherwise)
Job retention services or referrals	
Any job retention services or referrals	6.0
On-site job analysis services or referrals	4.9
Ergonomic assessment services or referrals	4.9
Assistance to employer to identify or implement workplace accommodations[b]	1.3
Job search or training services or referrals	
Any job search or training services or referrals	24.9
Job search services or referrals	24.0
Job training services or referrals	8.7
Transitional work opportunity	2.7
Other employment-related services and supports	
Other employment services	9.1
Referral to employment-related supports	0.0

Source: RETAIN service use data.

[a] The percentage of treatment enrollees who received any employment services includes enrollees who used or were referred to one or more of the following: job retention services, job training and job search services, or other employment services.

[b] VT RETAIN provided employers with assessment and consultation on workplace accommodations (Keith et al. 2024).

RTW = return to work; s = cell suppressed because it represents fewer than three people.

Exhibit G.2. VT RETAIN: Services used by treatment enrollees, by characteristics at the time of enrollment

Variable	RTW plan established	Two or more RTW coordinator communications with enrollee	Any services or referrals to support job retention	Any services or referrals to job search or training
Demographic and health characteristics				
Younger than 50				
Yes	75.2	64.6	6.9	23.2
No	84.0	73.3	3.8	29.0
Difference	-8.7**	-8.7*	3.1	-5.8
Male				
Yes	79.3	67.0	4.5	27.9
No	76.8	67.2	7.0	22.9
Difference	2.6	-0.1	-2.5	5.1
Primary diagnosis is musculoskeletal				
Yes	79.7	68.1	2.9	19.6
No	76.9	66.7	7.4	27.2
Difference	2.8	1.4	-4.5**	-7.7*
Primary or secondary behavioral health condition				
Yes	85.4	75.5	7.9	30.8
No	62.2	50.0	2.0	12.8
Difference	23.3***	25.5***	5.9***	18.0***
High school education or less				
Yes	78.4	67.1	6.6	28.7
No	77.4	67.1	5.7	22.6
Difference	1.1	-0.1	0.9	6.1
Employment and economic circumstances				
Worked within one week of enrollment				
Yes	78.6	67.1	5.7	22.5
No	76.5	67.1	6.5	28.8
Difference	2.1	0.1	-0.8	-6.3
Reported dissatisfaction or conflict with current job or employer				
Yes	100.0	90.0	10.0	45.0
No	75.6	64.9	5.6	22.9
Difference	24.4***	25.1***	4.4	22.1***
Reported problems related to housing and economic circumstances				
Yes	98.2	87.5	8.0	39.3
No	71.0	60.4	5.3	20.1
Difference	27.2***	27.1***	2.7	19.2***

Source: RETAIN service use data.

*/**/*** Difference is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

GED = General education degree; n.a. = not applicable; RTW = return to work; s = cell suppressed because it represents (or enables logical inference of the value of a cell that represents) fewer than three people; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

B. Impact analysis results

1. Results from the impact analysis

Exhibit G.3. VT RETAIN: One-year impacts on enrollee outcomes (percentage unless otherwise noted)

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Primary outcomes (one-tailed test)							
Employed in the fourth quarter after enrollment	65.1	-3.8	0.87	3.3	-0.099	436	331
Earnings in Quarters 1–4 after enrollment ($)	28,207	-2,328	0.94	1,484	-0.080	436	331
Applied for SSDI or SSI	10.8	-1.2	0.30	2.2	-0.078	436	331
Labor force attachment and employment (two-tailed test)							
Employment and earnings in the four quarters after enrollment							
Ever employed in							
Quarter 1	67.0	0.5	0.86	2.8	0.013	436	331
Quarter 2	68.7	-4.9	0.14	3.3	-0.132	436	331
Quarter 3	64.7	-0.1	0.97	3.5	-0.003	436	331
Quarter 4	65.1	-3.8	0.26	3.3	-0.099	436	331
Quarters 1–4	77.5	0.2	0.95	3.4	0.007	436	331
Earnings in quarters after enrollment							
Quarter 1 ($)	6,939	-699*	0.07	383	-0.093	436	331
Quarter 2 ($)	7,139	-597	0.20	461	-0.076	436	331
Quarter 3 ($)	7,126	-563	0.20	436	-0.072	436	331
Quarter 4 ($)	7,003	-469	0.28	434	-0.058	436	331
Quarters 1–4	28,207	-2,328	0.12	1,484	-0.080	436	331
Earned above SGA in quarters after enrollment							
Quarter 1	50.1	-2.8	0.37	3.1	-0.067	436	331
Quarter 2	50.0	-3.4	0.33	3.5	-0.083	436	331
Quarter 3	50.4	-3.8	0.26	3.3	-0.092	436	331
Quarter 4	48.8	-3.3	0.30	3.2	-0.081	436	331

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Employment at the time of the survey							
Connected to an employer (currently working on or leave)	77.6	-1.6	0.65	3.6	-0.056	343	269
Working	74.2	-3.3	0.40	3.9	-0.101	343	269
Connected to an employer or looking for work	90.9	-2.7	0.17	1.9	-0.176	343	269
Working or engaged in occasional activities or side jobs	80.3	-4.5	0.24	3.8	-0.160	343	269
Participated in any job-related training	7.2	2.5	0.20	2.0	0.199	320	244
Average weekly pay ($)	684	-72	0.22	58	-0.113	343	269
Usual hours worked per week	24.2	-2.3	0.15	1.6	-0.131	343	269
Tenured at job for at least one year	43.2	2.0	0.62	4.1	0.050	343	269
Working for an employer that offers health insurance	46.6	-5.6	0.17	4.0	-0.137	343	269
Working for an employer that offers paid leave	53.6	-6.8	0.12	4.3	-0.165	343	269
SSA program participation in the 12 months after enrollment (two-tailed test)							
Applied for SSDI or SSI	10.8	-1.2	0.60	2.2	-0.078	436	331
Received SSI or SSDI	10.1	0.7	0.70	1.9	0.048	436	331
SSA payment amount (SSI or SSDI; $)	1,642	-48	0.89	342	-0.009	436	331
Applied for SSDI	10.0	-1.2	0.57	2.2	-0.089	436	331
Received SSDI benefit	9.6	1.0	0.60	1.8	0.064	436	331
SSDI benefit amount ($)	1,600	-31	0.93	337	-0.006	436	331
Applied for SSI	5.4	-1.2	0.41	1.5	-0.165	436	331
Received SSI payment	1.1	-0.4	0.53	0.6	-0.269	436	331
SSI payment amount ($)	42	-18	0.59	32	-0.041	436	331
Household economic well-being in the month before the survey (two-tailed test)							
Household income ($)	4,769	-60	0.85	316	-0.015	330	256
Household earnings ($)	4,056	-152	0.61	298	-0.043	336	264
Receipt of public assistance benefits	19.1	5.1	0.20	4.0	0.183	342	268
UI benefit amount ($)	31	-25	0.13	17	-0.162	342	267
SNAP benefit amount ($)	52	29*	0.06	15	0.161	342	268
Government housing assistance amount ($)	39	35*	0.09	20	0.143	342	268

Outcome measure	Control group mean	Impact	*p*-value	Standard error	Effect size	Treatment group N	Control group N
Receipt of workers' compensation benefits	3.1	-0.7	0.65	1.4	-0.150	341	267
Workers' compensation amount ($)	56	7	0.85	39	0.017	341	267
Receipt of private short- or long-term disability payments	3.4	3.1*	0.09	1.8	0.415	342	268
Private disability benefit amount ($)	67	37	0.34	39	0.081	342	268
Health at the time of the survey (two-tailed test)							
Self-reported health is at least fair	92.7	-2.8	0.22	2.3	-0.217	339	267
Self-reported health is good or better	53.8	1.4	0.75	4.5	0.034	339	267
Self-reported health is very good or excellent	13.0	7.6**	0.02	3.2	0.335	339	267
Covered by health insurance	95.4	2.1	0.19	1.6	0.389	339	267
During past two months, pain interfered with work most or all the time	41.0	3.8	0.35	4.0	0.094	340	266
Number of poor physical health days in past month	12.1	0.4	0.65	0.9	0.037	340	265
Number of poor mental health days in past month	14.7	0.3	0.66	0.8	0.032	339	266
Pain score (range: 0 to 10)	4.1	0.1	0.58	0.2	0.045	338	264
Prescribed opioid pain relievers	5.7	3.6*	0.05	1.8	0.317	339	265

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for primary outcomes is based on a one-tailed *t*-test and the *p*-value for other outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

^/^^/^^^ Impact estimate is significantly greater (in the case of employment and earnings) or less (in the case of applications for SSI or SSDI) than zero (*p*-value is less than .10/.05/.01) using a one-tailed *t*-test.

N= sample size; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance

2. Results from the subgroup analysis

Exhibit G.4. VT RETAIN: One-year impacts on enrollee outcomes, by age (percentage unless otherwise noted)

Outcome measure	Younger than 50					50 and older					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	63.5	-0.3	0.93	306	217	67.5	-10.1*	0.08	130	114	0.13
Earnings in the four quarters after enrollment ($)	28,420	-2,208	0.20	306	217	27,796	-2,695	0.23	130	114	0.85
Applied for SSI or SSDI during the 12 months after enrollment	10.8	-0.4	0.86	306	217	10.6	-2.6	0.56	130	114	0.66
Other outcomes											
Connected to an employer at the time of survey	75.1	2.8	0.51	231	166	81.0	-8.6*	0.10	112	103	0.05††
Working at the time of survey	74.4	-2.2	0.65	231	166	72.7	-3.8	0.49	112	103	0.82
Average weekly pay ($) at the time of survey	751	-116*	0.06	231	166	580	10	0.91	112	103	0.15
Usual hours worked per week at the time of survey	25.1	-2.8	0.11	231	166	22.4	-1.1	0.61	112	103	0.46
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	845	-327	0.35	306	217	3,491	342	0.76	130	114	0.58
Household income in past month ($)	4,667	17	0.96	224	159	5,025	-334	0.62	106	97	0.65
Receipt of public assistance benefits in past month	22.8	2.0	0.67	231	165	12.8	10.3*	0.05	111	103	0.17
Number of poor physical health days in past month	12.0	-0.3	0.75	229	163	12.5	1.5	0.27	111	102	0.23
Number of poor mental health days in past month	15.6	-0.4	0.68	229	163	12.9	1.8	0.27	110	103	0.27

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit G.5. VT RETAIN: One-year impacts on enrollee outcomes, by sex (percentage unless otherwise noted)

Outcome measure	Female					Male					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	68.2	-5.5	0.15	263	229	59.3	-0.5	0.94	173	102	0.52
Earnings in the four quarters after enrollment ($)	28,657	-3,170*	0.05	263	229	27,199	-724	0.80	173	102	0.45
Applied for SSI or SSDI during the 12 months after enrollment	11.6	-3.1	0.28	263	229	9.0	2.4	0.50	173	102	0.24
Other outcomes											
Connected to an employer at the time of survey	77.6	0.1	0.97	207	194	78.1	-5.4	0.42	136	75	0.52
Working at the time of survey	74.6	-1.1	0.82	207	194	74.1	-7.9	0.25	136	75	0.45
Average weekly pay ($) at the time of survey	663	-52	0.49	207	194	754	-123	0.18	136	75	0.56
Usual hours worked per week at the time of survey	23.7	-2.0	0.30	207	194	25.3	-3.1	0.23	136	75	0.73
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,763	-362	0.42	263	229	1,351	548	0.36	173	102	0.25
Household income in past month ($)	4,801	-94	0.83	201	186	4,694	12	0.98	129	70	0.87
Receipt of public assistance benefits in past month	20.3	3.0	0.52	207	193	16.1	9.6	0.13	135	75	0.37
Number of poor physical health days in past month	13.3	-0.3	0.81	206	191	9.6	1.8	0.27	134	74	0.30
Number of poor mental health days in past month	14.9	0.3	0.74	206	192	14.2	0.4	0.79	133	74	0.94

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT

RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit G.6. VT RETAIN: One-year impacts on enrollee outcomes, by education (percentage unless otherwise noted)

Outcome measure	No postsecondary education					Any postsecondary education					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	65.8	-9.0	0.12	162	125	64.7	-0.7	0.86	274	206	0.25
Earnings in the four quarters after enrollment ($)	27,286	-4,680***	0.01	162	125	28,773	-964	0.66	274	206	0.19
Applied for SSI or SSDI during the 12 months after enrollment	12.4	-0.6	0.86	162	125	9.9	-1.5	0.62	274	206	0.85
Other outcomes											
Connected to an employer at the time of survey	75.9	-6.3	0.32	107	86	78.4	0.5	0.91	236	183	0.36
Working at the time of survey	74.7	-9.0	0.20	107	86	73.9	-0.6	0.89	236	183	0.33
Average weekly pay ($) at the time of survey	639	-102	0.15	107	86	716	-65	0.38	236	183	0.69
Usual hours worked per week at the time of survey	24.0	-4.0	0.10	107	86	24.3	-1.6	0.39	236	183	0.42
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,512	72	0.88	162	125	1,723	-124	0.80	274	206	0.78
Household income in past month ($)	4,138	-103	0.80	100	80	5,079	-79	0.84	230	176	0.96
Receipt of public assistance benefits in past month	27.5	12.7*	0.08	107	86	14.9	1.9	0.62	235	182	0.15
Number of poor physical health days in past month	12.3	0.5	0.77	107	84	12.0	0.4	0.71	233	181	0.94
Number of poor mental health days in past month	15.2	1.7	0.30	107	85	14.4	-0.3	0.77	232	181	0.31

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 level (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit G.7. VT RETAIN: One-year impacts on enrollee outcomes, by primary diagnosis (percentage unless otherwise noted)

Outcome measure	Musculoskeletal					Non-musculoskeletal					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	65.8	-7.4	0.21	134	105	64.7	-2.0	0.62	302	226	0.43
Earnings in the four quarters after enrollment ($)	29,365	-6,038**	0.03	134	105	27,548	-445	0.80	302	226	0.08†
Applied for SSI or SSDI during the 12 months after enrollment	7.5	2.2	0.53	134	105	12.5	-3.0	0.27	302	226	0.23
Other outcomes											
Connected to an employer at the time of survey	79.3	-7.6	0.18	111	94	76.4	1.7	0.71	232	175	0.18
Working at the time of survey	74.1	-6.2	0.31	111	94	73.9	-1.5	0.75	232	175	0.53
Average weekly pay ($) at the time of survey	752	-114	0.22	111	94	658	-52	0.41	232	175	0.53
Usual hours worked per week at the time of survey	23.6	-1.5	0.57	111	94	24.5	-2.7	0.13	232	175	0.67
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,097	283	0.67	134	105	1,890	-197	0.61	302	226	0.54
Household income in past month ($)	5,269	-658	0.32	108	88	4,510	251	0.47	222	168	0.23
Receipt of public assistance benefits in past month	22.0	9.3	0.12	111	94	17.8	3.1	0.52	231	174	0.40
Number of poor physical health days in past month	13.6	-0.3	0.84	111	93	11.5	0.5	0.64	229	172	0.65
Number of poor mental health days in past month	12.7	1.3	0.39	110	94	15.6	0.0	0.98	229	172	0.48

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

Exhibit G.8. VT RETAIN: One-year impacts on enrollee outcomes, by time since last worked (percentage unless otherwise noted)

Outcome measure	Last worked one week or less before enrollment					Last worked more than one week before enrollment					*p*-value for subgroup difference
	Control mean	Impact	*p*-value	Treatment group N	Control group N	Control mean	Impact	*p*-value	Treatment group N	Control group N	
Primary outcomes											
Employed in the fourth quarter after enrollment	66.8	-1.6	0.70	270	211	61.8	-6.5	0.23	166	120	0.45
Earnings in the four quarters after enrollment ($)	28,292	-432	0.80	270	211	27,713	-4,807**	0.03	166	120	0.10†
Applied for SSI or SSDI during the 12 months after enrollment	8.1	-0.2	0.95	270	211	15.8	-3.4	0.45	166	120	0.52
Other outcomes											
Connected to an employer at the time of survey	82.8	0.5	0.90	214	177	68.3	-4.9	0.47	129	92	0.48
Working at the time of survey	81.6	-2.6	0.58	214	177	60.9	-4.0	0.54	129	92	0.85
Average weekly pay ($) at the time of survey	719	-47	0.53	214	177	631	-104	0.14	129	92	0.54
Usual hours worked per week at the time of survey	26.6	-1.8	0.34	214	177	19.4	-2.3	0.29	129	92	0.85
SSA payment amount (SSI or SSDI; $) in the 12 months after enrollment	1,328	-163	0.72	270	211	2,230	34	0.96	166	120	0.84
Household income in past month ($)	5,027	-150	0.73	205	170	4,311	93	0.81	125	86	0.66
Receipt of public assistance benefits in past month	19.8	4.3	0.32	213	176	17.2	7.7	0.28	129	92	0.67
Number of poor physical health days in past month	12.7	-0.2	0.82	212	175	11.1	1.5	0.29	128	90	0.30
Number of poor mental health days in past month	15.3	-0.4	0.73	212	176	13.5	1.5	0.27	127	90	0.30

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: Outcome measures reflect enrollees' outcomes in the year after enrollment. This table shows the regression-adjusted means for the control group (the estimate of the counterfactual) and the regression-adjusted estimates of VT RETAIN's impacts. To calculate the adjusted mean for the treatment group, add the impact estimate and the adjusted mean for the control group. The sample size varies by outcomes because of survey item nonresponse. The response rate for the one-year follow-up survey for VT RETAIN was 73.9 percent. For outcomes measured using survey data, we weighted the statistics to adjust for nonresponse. The *p*-value for all outcomes is based on a two-tailed *t*-test.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

†/††/††† Impact estimates for subgroups are significantly different from each other (*p*-value is less than .10/.05/.01) using an adjusted Wald test.

N= sample size; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from sensitivity tests

Exhibit G.9. VT RETAIN: One-year impacts on enrollee outcomes, by estimation approach (percentage unless otherwise noted)

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Primary outcomes					
Employed in the fourth quarter after enrollment	-3.8	n.a.	-2.4	-3.8	n.a.
Earnings in Quarters 1–4 after enrollment	-2,328	n.a.	-1,700	-2,390	n.a.
Applied for SSDI or SSI	-1.2	n.a.	-1.2	-1.3	n.a.
Labor force attachment and employment					
Employment and earnings in the four quarters after enrollment					
Ever employed in					
Quarter 1	0.5	n.a.	1.4	0.2	n.a.
Quarter 2	-4.9	n.a.	-4.1	-4.9	n.a.
Quarter 3	-0.1	n.a.	0.0	-1.0	n.a.
Quarters 1–4	0.2	n.a.	0.4	-0.1	n.a.
Earnings in quarters after enrollment					
Quarter 1 ($)	-699*	n.a.	-498	-700	n.a.
Quarter 2 ($)	-597	n.a.	-474	-625	n.a.
Quarter 3 ($)	-563	n.a.	-396	-540	n.a.
Quarter 4 ($)	-469	n.a.	-332	-525	n.a.
Earned above SGA in quarters after enrollment					
Quarter 1	-2.8	n.a.	-2.4	-3.8	n.a.
Quarter 2	-3.4	n.a.	-2.5	-3.7	n.a.
Quarter 3	-3.8	n.a.	-2.8	-3.8	n.a.
Quarter 4	-3.3	n.a.	-3.0	-4.2	n.a.
Employment at the time of the survey					
Connected to an employer (currently working on or leave)	-1.6	-2.2	-2.9	-2.2	n.a.
Working	-3.3	-3.9	-4.2	-3.9	n.a.
Connected to an employer or looking for work	-2.7	-2.7	-2.0	-1.6	-2.7

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Working or engaged in occasional activities or side jobs	-4.5	-4.9	-4.3	-4.6	n.a.
Participated in job-related training	2.5	2.5	3.4	3.1	n.a.
Average weekly pay ($)	-72	-75	-79	-84	-65
Usual hours worked per week	-2.3	-2.4	-2.3	-2.3	-2.3
Tenured at job for at least one year	2.0	1.8	-1.2	-1.5	2.0
Working for an employer that offers health insurance	-5.6	-5.9	-7.3*	-6.9*	-5.9
Working for an employer that offers paid leave	-6.8	-7.3*	-8.2*	-7.7*	-6.7
SSA program participation					
SSDI or SSI program participation in the 12 months after enrollment					
Received SSI or SSDI	0.7	n.a.	-0.6	-0.9	n.a.
SSA payment amount (SSI or SSDI; $)	-48	n.a.	-310	-343	n.a.
Applied for SSDI	-1.2	n.a.	-1.3	-1.3	n.a.
Received SSDI benefit	1.0	n.a.	-0.2	-0.5	n.a.
SSDI benefit amount ($)	-31	n.a.	-284	-315	n.a.
Applied for SSI	-1.2	n.a.	-0.8	-0.9	n.a.
Received SSI payment	-0.4	n.a.	-0.5	-0.5	n.a.
SSI payment amount ($)	-18	n.a.	-26	-28	n.a.
Economic well-being in the month before the survey					
Household income ($)	-60	-69	-356	-385	n.a.
Household earnings ($)	-152	-163	-271	-358	n.a.
Receipt of public assistance benefits	5.1	5.3	5.8	5.9	n.a.
Household UI benefit amount ($)	-25	-21	-19	-21	-18
SNAP benefit amount ($)	29*	29*	31*	31*	28*
Government housing assistance amount ($)	35*	35*	34	34	35*
Receipt of workers' compensation benefits	-0.7	-0.7	-0.4	-0.5	n.a.
Household workers' compensation amount	7	6	8	7	7
Receipt of short- or long-term disability payments	3.1*	3.2*	3.0	3.1*	n.a.

Outcome measure	Main model	No weighting for nonresponse	No covariate adjustment	Adjustment for strata only	No imputation
Household private disability benefit amount ($)	37	38	32	36	37
Health at the time of the survey					
Self-reported health is at least fair	-2.8	-2.9	-2.6	-2.2	n.a.
Self-reported health is good or better	1.4	1.5	1.5	2.8	n.a.
Self-reported health is very good or excellent	7.6**	8.0**	7.2**	8.0***	n.a.
Covered by health insurance	2.1	1.9	1.0	1.1	n.a.
During past two months, pain interfered with work most or all the time	3.8	3.4	2.1	1.5	n.a.
Number of poor physical health days in past month	0.4	0.4	-0.6	-0.6	n.a.
Number of poor mental health days in past month	0.3	0.3	0.8	0.3	n.a.
Pain score (range: 0 to 10)	0.1	0.1	0.0	-0.1	n.a.
Prescribed opioid pain relievers	3.6*	3.5*	1.5	2.0	n.a.

Source: RETAIN enrollment data; one-year follow-up survey; SSA data; state UI wage records.

Note: This table shows the impact estimates of VT RETAIN, using different modeling approaches. In the main model, we used covariate adjustment and weighted statistics to adjust for survey nonresponse; we also used multiple imputation when an outcome had a missing value conditional on the value of another variable. In the model with "No weighting for nonresponse," we followed the main model but did not apply weights for nonresponse. In the model with "No covariate adjustment," we followed the main model but did not include covariates. In the model with "Adjustment for strata only," we followed the main model but only adjusted for the characteristics based on which we stratified random assignment. In the model with "No multiple imputation," we followed the main model while excluding cases with outcomes that had a missing value conditional on the value of another variable. This resulted in our dropping between 0.0 percent to 3.2 percent of observations for these outcomes.

*/**/*** Impact estimate is significantly different from zero (*p*-value is less than .10/.05/.01) using a two-tailed *t*-test.

n.a. = not applicable; SGA= substantial gainful activity; SNAP= Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI= Unemployment Insurance.

4. Results from supplementary Bayesian analysis

Exhibit G.10. VT RETAIN: Bayesian interpretation of impacts on primary outcomes

Outcome	Control group mean	Impact: posterior mean (standard deviation)	Impact: 90 percent credible interval	Probability of favorable impact[a] (%)	Probability of large favorable impact[b] (%)	Probability of large unfavorable impact[b] (%)
Earnings in quarters 1–4 after enrollment ($)	28,207	-856 (1,130)	(-2,855, 813)	23	10	59
Employed in the fourth quarter after enrollment (%)	77.5	0.3 (1.4)	(-1.9, 2.5)	60	2	2
Applied for SSDI or SSI (%)	10.8	-0.3 (0.8)	(-1.7, 1.0)	65	37	15

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: This table shows the regression-adjusted means for the control group from the main analysis (the estimate of the counterfactual) and the regression-adjusted Bayesian estimates of RETAIN's impacts. Namely, for Bayesian impact estimates, we present the posterior mean (the point estimate), the standard deviation (the variability around that point estimate), which is also presented as a 90 percent credible interval (corresponding to the 5th and 95th percentiles of the posterior distribution). There is a 90 percent probability that the true impact lies within this credible interval, given the data and prior assumptions.

[a] A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI.

[b] As a threshold for a "large" impact, we used $500 for earnings (approximately the impacts many RETAIN programs need to break even within 20 years, see Section V.D.). For employment, we used 3 percentage points, and for earnings, we used 0.5 percentage points, which both constitute approximately 5 percent of the control group's mean outcome.

Exhibit G.11. VT RETAIN: Sensitivity of Bayesian estimates of the probability of favorable impacts to different prior assumptions (percentage)

Outcome measure	Main Bayesian model	Halved importance of priors
Probability of an increase in earnings in quarters 1–4 after enrollment	23	18
Probability of an increase in employment in the fourth quarter after enrollment	60	59
Probability of a decrease in applications for SSDI or SSI	65	68

Source: RETAIN enrollment data; state UI wage records; SSA data.

Note: A favorable impact corresponds to a positive impact for earnings or employment and a negative impact for applications for SSDI or SSI. The sensitivity test halved the importance of literature-derived prior information.

C. Benefit-cost analysis results

1. Results from benefit-cost analysis

Exhibit G.12. VT RETAIN: Benefits and costs in the year after enrollment per treatment enrollee, by accounting perspective

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Benefit-cost summary measures				
Net benefits (benefits minus costs)	-$1,934	-$17,450	$163	-$19,221
Benefit-cost ratio[a]	n.a.	-0.09	n.a.	-0.20
Program costs				
Personnel and labor costs				
Wages		-$8,842		-$8,842
Fringe benefits		-$2,374		-$2,374
Payments for providing services				
Enrollee stipends[b]	$0	$0		$0
Payments for subcontractors for amounts less than 10 percent of expenditures[c]		$0		$0
Incentive payments for providers		-$56		-$56
Outreach costs		-$1,001		-$1,001
Other direct costs		-$326		-$326
Administrative and overhead costs		-$3,413		-$3,413
RETAIN program costs not invoiced to DOL		$0		$0
Total program costs	**$0**	**-$16,013**	**$0**	**-$16,013**
Indirect costs and benefits				
Earnings	-$2,328			-$2,328
Fringe benefits	-$1,056			-$1,056
Income and sales taxes[d]	$543	-$426	-$117	$0
Payroll taxes – OASDI	$144	-$289		-$144
Payroll taxes – Medicare	$34	-$68		-$34
Work- and childcare-related costs	$111			$111
SSDI benefits	-$31	$31		$0
SSDI administrative costs		$0		$0
SSDI application costs		$9		$9
SSI benefits	-$18	$18		$0
SSI administrative costs		$0		$0
SSI application costs		$17		$17
Medicaid benefits	-$62	$40	$21	$0
Household short- or long-term private disability payments	$240			$240
Household UI benefits	-$302		$302	$0

Benefits and costs	Treatment enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Household UI administrative costs		$37		$37
Household workers' compensation benefits	$23		-$23	$0
Household SNAP benefits	$347	-$347		$0
Household SNAP administrative costs		-$3	-$21	-$24
Household public housing assistance	$421	-$421		$0
Household public housing assistance administrative costs		-$36		-$36
Total indirect costs and benefits	**-$1,934**	**-$1,437**	**$163**	**-$3,208**

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: Benefits and costs that are not relevant to a perspective are indicated by a blank cell. To construct each component of the benefit-cost analysis, we used the estimated impacts on key outcomes (regardless of whether they were statistically significant), or imputation methods that combined the impact estimates with data from enrollee surveys and external sources. To construct program costs, we used data from the RETAIN grantee cost form and staff interviews. All benefits and costs are in dollars per enrollee.

[a] Calculated for all key stakeholders as total indirect costs and benefits divided by total program costs.

[b] Enrollee stipends included supportive services such as rent, transportation, or utility payments. We excluded incentive payments from these costs because they reflect evaluation-related expenses.

[c] Larger amounts are reflected in other categories.

[d] Income taxes include federal and state income taxes.

DOL = U.S. Department of Labor; OASDI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; UI = unemployment insurance.

2. Results from sensitivity tests

Exhibit G.13. VT RETAIN: Sensitivity of net benefits to sampling variability and different assumptions

Assumption	Net benefits			
	RETAIN enrollees (A)	Federal government (B)	State government (C)	All key perspectives (A + B + C)
Sensitivity to sampling variability for earnings impact				
Main benefit-cost analysis model	-$1,934	-$17,450	$163	-$19,221
Lower bound of 95% confidence interval	-$5,160	-$18,439	$16	-$23,583
Upper bound of 95% confidence interval	$1,291	-$16,461	$311	-$14,858
Sensitivity to assumptions				
Excluding fringe benefits	-$878	-$17,450	$163	-$18,165
Excluding SSI and SSDI application costs	-$1,934	-$17,476	$163	-$19,246
Using fixed work- and childcare-related expenses	-$2,048	-$17,450	$163	-$19,334
Used only statistically significant estimates in the calculation[a]	$0	-$16,013	$0	-$16,013

Source: See Exhibit B.3 for details on the sources and imputation methods for each benefit or cost component.

Note: The inputs for the benefit-cost analysis are based on (1) program costs drawn from Federal Financial Reports, the RETAIN grantee cost form, and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. The net benefits shown in each cell represent the net benefits (benefits minus costs) in the year after enrollment, calculated using the specified assumption, by accounting perspective. Net benefits are in 2024 dollars per enrollee.

[a] This analysis assigns a value of zero to impact estimates that were not significant at the 0.10 level. The main analysis and all other sensitivity tests include impact estimates regardless of whether they were statistically significant.

SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3. Results from forecasting and cost neutrality analyses

Exhibit G.14. VT RETAIN: Impacts on annual earnings needed for cost neutrality at five, 10, and 20 years after enrollment, from all key accounting perspectives

Time frame to cost neutrality	Annual earnings impact needed for cost neutrality
Five years after enrollment	$2,368
10 years after enrollment	$1,328
20 years after enrollment	$841

Note: The inputs for the cost neutrality analysis are based on (1) program costs drawn from the RETAIN grantee cost form and staff interviews, (2) the estimated impacts on key outcomes (regardless of whether they were statistically significant), or (3) imputation methods that combined the impact estimates with data from external sources. We calculate the annual impact on earnings that would be needed in each future year to make the program cost neutral within the time frames indicated.

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