Mathematica
Progress Together

A Request for Information for

Health Technology Ecosystem

RFI Number: CMS-0042-NC, RIN 0938-AV68
June 16, 2025

Submitted to:

Centers for Medicare & Medicaid Services
Assistant Secretary for Technology Policy
Office of the National Coordinator for Health Information Technology
U.S. Department of Health and Human Services
7500 Security Boulevard, Mail Stop C4-26-05
Baltimore, MD 21244-1850
Attention: CMS RFI Review Team

Submitted by:

Mathematica
1100 First Street, NE, 12th Floor
Washington, DC 20002-4221
Phone: (202) 484-9220
Fax: (609) 228-4958

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RE: CMS-0042-NC, RIN 0938-AV68; Request for Information; Health Technology Ecosystem

Dear CMS RFI Review Team:

Mathematica welcomes the opportunity to contribute to the U.S. Department of Health and Human Services' efforts to modernize and strengthen the digital health ecosystem for Medicare beneficiaries. We commend the Centers for Medicare & Medicaid Services (CMS) and the Assistant Secretary for Technology Policy/Office of the National Coordinator for Health Information Technology for issuing a request for information (RFI) to seek input from the public regarding the market of digital health products for Medicare beneficiaries and the broader health technology infrastructure, including the state of data interoperability. We strongly support these efforts to examine and enhance the role that innovative technology can play in delivering high-quality care to Medicare beneficiaries and improving the administration of federal health insurance programs. In response to this RFI, we are pleased to submit comments on questions PC-7, PR-2, PR-8, PA-5, TD-9d, TD-12, TD-19, VB-1, VB-2, VB-4, and VB-12. Our input reflects our technical expertise and commitment to helping the federal government harness technology in practical and patient-centered ways.

Mathematica is an employee-owned company that partners with federal and state agencies, as well as private and philanthropic organizations, to address complex policy and program challenges. We provide end-to-end support across data and technology strategy, program implementation, and policy advisory services. As a reliable partner to CMS, we bring proven experience advancing data-driven solutions to improve health care delivery, interoperability, and program performance across public systems.

We appreciate CMS's commitment to identifying and advancing policy approaches that more effectively harness the potential of innovative health technologies, as well as its commitment to thoughtful engagement with stakeholders throughout this important process. If you have any questions regarding our submission, please email rfpcenter@mathematica-mpr.com.

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Contents

Exhibits

B. Patient and Caregivers

1. Patient needs

PC-7. If CMS were to collect real-world data on digital health products' impact on health outcomes and related costs once they are released into the market, what would the best means of doing so?

For this issue, Mathematica believes it is important to examine the problem and the solution, comprehensively.

Problem

Digital health technologies hold promise to improve and innovate patient care. However, assessing the effectiveness and value of these interventions remains a major challenge. Given the staffing shortages in the healthcare workforce and growing unmet patient needs, digital health offers potential innovation for patient care that can address population-scale problems. Yet, CMS's ability to assess digital health solutions quickly and efficiently is limited by difficult-to-access data hindering formal assessments.

Performing health technology assessment to inform coverage and clinical decision making is a challenge with digital health technology—from platforms that enable remote patient-monitoring, to platforms that address care coordination and specialty conditions, to prescription digital therapeutics. With the advent of GenAI lowering the cost to develop and add features to digital platforms, plus the recent success of companies making initial public offerings, the number of digital health solutions is expected to grow. However, these solutions are entering the Medicare and Medicaid ecosystems faster than payers, providers, and patients can assess their real-world value.

A major challenge for digital health technology assessment is the lack of data to evaluate these technologies—specifically, data that can link information on cost and outcomes to patients and providers. Ideal technology assessment involves structured data collected from healthcare claims, electronic health record (EHR) systems, or even surveys or registries, to assess effectiveness. However, billing systems and digital health's unique financial arrangements mean this information isn't readily accessible. Comprehensive data aggregation solutions such as Truveta integrate many types of healthcare data into one platform, but structured data does not capture the use of digital health technologies.

Potential solution

The ideal method for collecting data is through claims data; with a secondary option of a vendor-supplied "site-of-use" registry. Using claims is ideal, because providers routinely submit claims for reimbursement, and fields are available to add procedure codes or modifiers to capture technology use. However, because not all digital health technologies submit claims for reimbursement (for example, subscription models paid by patients, providers, plans, or employers), this approach would require a vendor-supplied registry.

This registry can apply existing standards and infrastructure for data exchange. There are many examples of Fast Healthcare Interoperability Resources (FHIR) protocols for similar registries, and

the infrastructure and marketplace exist to link these registries with other sources to perform the evaluation.

This registry would be available via an application programming interface (API) and have structured information on which patients or providers are using which technology. The value to mandating such an API is that it could reduce the time to assess technology, which is a benefit to the vendor. Similarly, by reducing the complexity of the methods or data collection to ascertain who is using what digital technology, regulators would incentivize use of such APIs; namely, establishing such API access would provide a mechanism to obtain coverage via the Medicare fee schedule, or to be considered an approved technology. Given that these digital apps are subject to the Trusted Exchange Framework and Common Agreement (TEFCA) and that they are already managing highly sensitive data, placing the responsibility on the digital health provider is aligned with current priorities and required practices.

Connecting to the marketplace

Digital health technologies are a missing piece from the real-world data (RWD) ecosystem. Technology assessments require large amounts of disparate data to study patient experience, cost, and outcomes, but much of the data and infrastructure needed to support such analyses exist today. For example, the Datavant ecosystem allows for privacy-preserving linkage of disparate data sets using tokens, a technology already used to link clinical trial data to other data sources. As another solution, HealthVerity has a token and an established marketplace to link data. This allows for all required data—claims, EMR, laboratory tests, and pharmacy data—to be licensed and linked for technology assessment. And for a comprehensive, enterprise-level solution, these data can link into Truveta, which aggregates EMR, claims, lab, pharmacy, mortality, and other real-world data under one platform. The most pressing need is a way to integrate into the RWD ecosystem a roster of patients and providers using digital health technologies.

C. Providers

1. Digital health apps

PR-2. What are obstacles that prevent development, deployment, or effective utilization of the most useful and innovative applications for physician workflows, such as quality measurement reporting, clinical documentation, and billing tasks? How could these obstacles be mitigated?

A common data model (CDM) and common data assets that reorient most use cases toward a reusable data asset would free up clinicians' attention for the most innovative use cases. Mathematica works extensively with healthcare data sets created through these physician workflows, such as claims data, including extensive work with downstream uses of these and other similar data sets. This response addresses the kind of applications and needs that rely on the data gathered from these workflows. A meaningful barrier to developing and deploying useful and innovative applications for physician workflows is the lack of reusability of the data captured at the point of care, and the lack of coordination related to these requests, preventing meaningful innovation and resulting in a high level of administrative burden for providers.

Most parts of the healthcare ecosystem operate using data produced during the short window in which the provider and patient are engaged. Although well intentioned, efforts to improve billing,

improve quality, reduce costs, and improve workflows to support the patient often manifest as administrative burdens to providers in the form of requests for information at critical moments, as well as additional cost to deploy these tools. This burden is increasingly untenable, however, as requests require more time and capacity than clinicians can offer—compromising their ability to spend time with their patients. New data requests stemming from innovation projects can be complex. They may unearth quality issues related to needed data elements that require additional documentation or changes to the way that documentation is captured. Furthermore, the current state of data management often supports workarounds that increase physician burden rather than encourage the use of reusability data assets.

One key way to reduce provider burden, while encouraging private-sector innovation, is to further align efforts to use a CDM or common data assets. Instead of relying too heavily on data captured at the point of care and workflow changes that depend on provider engagement, we can encourage innovators to spend most of their time working upstream on the data itself and improving that data asset. This approach would mark a change: today, we tend to invest in exceptions, rather than increasingly reusable systems. Making this change may also have the added benefit of reducing the cost of new deployments, encouraging innovation.

Ways to reduce administrative burden and increase space for innovation include the following:

- **Aligning on a CDM for analytic and operating purposes.** Today, hospitals and health systems conduct much of the work to normalize data captured at the point of care for downstream use in a highly individualized manner. The differences in how they organize and extract data creates an unnecessarily complicated web of data flows that makes it hard for innovation downstream, and results in too many workarounds that add administrative burden to providers. Furthermore, the work of normalizing the most-used healthcare data sets, such as claims and EHR data, is converging in practice, as evidenced by open-source data models gaining traction for these purposes.

  Although initially, a CDM might feel like a constraint to end users used to requesting highly specific data tailored to their use, the long-term benefit of improving on a core method of data normalization would solve many more use cases over time and improve rapidly with use. It would streamline the work of providers handling downstream requests as well as their data collection and coding needs by limiting variability in requests, improving focus and the overall quality of documentation. The CDM should be openly available and generally accepted.

- **Investing in common, reusable healthcare data sets.** This investment would reduce the burden on clinician workflows and increase data availability for innovation. To start, we would recommend looking for private and publicly available data sets, as we discuss in Question TD-12. In our experience, the data quality of these data assets tends to improve in proportion to use, so one of the most effective ways to ensure high-quality, clean data is sent to these systems is for federal efforts to use these data sets for their own quality, operating, and reporting purposes.

  Overall, by driving requests for data from the point of care to common data sets and normalized data models, we could minimize request for changes at the point of care that represent inefficiency and process waste, freeing space for innovation.

Wherever possible, we encourage CMS to take a payer-agnostic view to solving these challenges, as clinicians need to work seamlessly across all populations to drive innovation. Determining a CDM and reusable data sets should include considerations for commercial healthcare, Medicare, and Medicaid populations.

2. Data exchange

PR-8. What are ways CMS or partners can help with simplifying clinical quality data responsibilities of providers?

Physician practices in the United States spend more than $15.4 billion annually on quality measure reporting.[1] Two of the most common challenges providers face are manual data entry and the complexities of collecting and transmitting data for measure reporting.[2] Thus, there is a critical need to reduce these burdens on providers.

Mathematica recommends that CMS or partners simplify clinical quality data responsibilities of providers by (1) encouraging providers to adopt artificial intelligence (AI)-powered documentation tools, and (2) accelerating the advancement of digital quality measures (dQMs) over traditional quality measures that often depend on manual data collection and abstraction (for example, MIPS Clinical Quality Measures [CQMs]).[3] With respect to our *first* recommendation, AI ambient scribes use natural language processing and machine learning to transcribe patient-provider conversation and extract relevant information to generate clinical notes in real time during patient encounters, which significantly reduces documentation time and cognitive burden.[4] AI tools also have shown potential to improve coding accuracy through structure data, helping providers streamline workflows and enhance the quality of clinical data.[5] However, these tools are intended to augment, not replace, the clinician's role in documentation and workflow.

Although AI ambient scribes can reduce documentation burden significantly, such tools alone will not eliminate the data reporting responsibilities placed on providers. Thus, our *second* recommendation is for CMS to fully transition to dQMs. Traditional quality measures often rely on manual data collection and abstraction,[6] which can be time-consuming and prone to error. Moving to dQMs can streamline reporting, improve data accuracy, and reduce administrative burden. Using dQMs also offers a more efficient alternative by using standardized, digital data from interoperable health systems.[7] These measures use a CDM such as FHIR to enable seamless data exchange across platforms.[8]

Mathematica has been at the forefront of the dQM transition for many years and has an unparalleled understanding of how to guide CMS through the process. For example, under our current CMS contract Behavioral Health Measures Development & Inpatient and Outpatient Measures

[1] https://www.healthaffairs.org/doi/10.1377/hlthaff.2015.1258?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub++0pubmed.
[2] Ibid.
[3] https://patient360.com/ecqm-vs-cqm-whats-the-difference/.
[4] https://www.riouxvision.com/the-integration-of-ai-scribes-with-ehr-systems-transforming-healthcare-documentation/.
[5] https://www.digitalhealthnews.com/ambience-healthcare-unveils-ai-model-that-outperforms-physicians-in-medical-coding-accuracy.
[6] https://patient360.com/ecqm-vs-cqm-whats-the-difference/.
[7] https://ecqi.healthit.gov/dqm?qt-tabs_dqm=about-dqms.
[8] Ibid.

Maintenance, we have a leading role designing and guiding the use of processes, documentation, and tools required to develop and maintain FHIR-based electronic CQMs (eCQMs).

Although CMS has made meaningful progress in defining and supporting dQMs (such as eCQMs), adoption remains inconsistent across its programs. CMS and its partners should accelerate the transition by embedding dQMs into model requirements and supporting providers—particularly those in small or rural practices—through technical assistance and infrastructure funding.

We recognize that although dQMs offer many benefits, they are significantly more costly to develop and maintain than traditional quality measures. They are more labor-intensive to develop and require technically skilled staff (for example, with knowledge in health information technology [IT], JSON, and FHIR APIs). To address these challenges, Mathematica is integrating AI into its measure development and maintenance processes to automate certain tasks. For instance, we have used large language models to conduct environmental scans, significantly reducing time and effort. We also are investigating how AI may be used to streamline our responses to ASTP/ONC Project Tracking System (Jira) tickets for Hospital Inpatient and Hospital Outpatient eCQMs.

CMS and its partners also can and should use AI across all phases of dQM development and maintenance to reduce effort and resource demands. This includes integrating AI capabilities into their tools such as the Measure Authoring Development Integrated Environment (MADiE). Streamlining the development of dQMs by integrating AI would reduce costs, ease the burden on measure developers, and accelerate the transition from traditional quality measures to fully digital quality measures and reporting.

a. *What would be the benefits and downsides of using bulk FHIR data exports from EHRs to CMS to simplify clinical quality data submissions? Can CMS reduce the burden on providers by performing quality metrics calculations leveraging bulk FHIR data exports?*

Bulk FHIR data exports have proven highly effective in reducing the reporting burden on providers by enabling quality metric calculations. This approach was successfully demonstrated in the HRSA Uniform Data System Plus initiative, which enabled the electronic submission of de-identified, patient-level data using FHIR standards.[9] The success of this initiative has paved the way for Bulk FHIR to streamline data exchange and improve efficiency across the healthcare system.

A key advantage of Bulk FHIR is its ability to extract large volumes of structured, standardized data efficiently from EHRs.[10] Using Bulk FHIR more broadly should enable CMS to calculate dQMs centrally from multiple programs and reduce the reporting burden on healthcare organizations significantly. Providers would be able to submit program data once for multiple quality programs, instead of submitting individual data files separately.

Even more valuable is the raw clinical data itself, which CMS and its partners can leverage for advanced analytics, clinical research, and measure testing. (Currently, some programs submit aggregate data.) In addition, measure developers could use Bulk FHIR data for testing and validation, helping lower development costs, accelerate the transition to dQMs, and support CMS's Consensus-Based Entity endorsement.

[9] https://bphc.hrsa.gov/data-reporting/uds-training-and-technical-assistance/uniform-data-system-uds-modernization-initiative.
[10] https://kodjin.com/blog/how-to-leverage-fhir-bulk-api-for-data-extraction/.

Challenges and limitations to implementing Bulk FHIR include technical and operational barriers, such as complex integration, security and privacy concerns, and issues with data quality and completeness.[11] Bulk data export is not yet a mandatory certification criterion. CMS and its partners should consider requiring the use of Bulk FHIR for a select group of quality program models. This would give CMS an opportunity to test and refine the process and policies for transitioning to Bulk FHIR efficiently.

b. In what ways can the interoperability and quality reporting responsibilities of providers be consolidated so investments can be dually purposed?

To consolidate providers' interoperability and quality reporting responsibility, CMS should fully adopt dQMs. Although CMS has made significant progress defining and supporting dQMs, full adoption remains uneven across programs. Unlike traditional quality measures, which often require manual data collection and abstraction,[12] dQMs use standardized digital data from multiple health information sources and are captured and exchanged through interoperable systems, significantly reducing reporting burden and improving accuracy.[13] For example, dQMs can access data through FHIR standards-based APIs, enabling real-time retrieval of the information needed for measure calculation.[14] This capability supports timely, data-driven decision making and ultimately leads to better patient outcomes.

CMS should adopt a two-phased strategy to support the full transition to dQMs while accelerating interoperability:

- **Phase 1:** Ensure quality program models require dQMs and offer focused support to providers—particularly those in small or rural practices—through technical assistance and infrastructure funding. This foundational support will promote adoption of EHRs and reduce barriers for providers with limited resources. As of 2021, there was a 78 percent EHR adoption rate among U.S. physicians. By aligning program requirements with digital reporting needs, CMS can accelerate the adoption of EHRs.[15]
- **Phase 2:** Transition existing traditional quality measures into dQMs. CMS should work closely with measure stewards to convert and modernize their measures. This effort should include streamlining the development process by using AI to enhance tools such as MADiE, helping reduce the time, cost, and complexity of developing and maintaining dQMs. This would benefit specialists particularly, who often have limited measure options.

c. Are there requirements CMS should consider for data registries to support digital quality measurement in a more efficient manner? Are there requirements CMS should consider for data registries that would support access to real-time quality data for healthcare providers to inform clinical care in addition to simplifying reporting processes?

To enable data registries to support dQMs effectively, CMS and its partners should require dQMs as part of quality program model requirements. This would create demand from providers, prompting registries to expand their capabilities and make more dQMs available in response. A phased

[11] https://etc-digital.org/2024/11/13/top-challenges-in-fhir-implementation-and-how-to-overcome-them/.
[12] https://patient360.com/ecqm-vs-cqm-whats-the-difference/.
[13] https://ecqi.healthit.gov/dqm?qt-tabs_dqm=about-dqms.
[14] Ibid.
[15] https://www.healthit.gov/data/quickstats/national-trends-hospital-and-physician-adoption-electronic-health-records.

approach is highly recommended, enabling data registries time to develop dQMs. CMS also should use AI to enhance its dQM measure development and maintenance tools such as MADiE. This approach can significantly reduce the time, cost, and complexity involved in developing and maintaining dQMs, making it easier for measure developers (such as data registries) and stewards to scale their efforts.

Finally, requiring Bulk FHIR capabilities for data registries would greatly improve healthcare providers' access to real-time quality data. Bulk FHIR would streamline reporting processes and enhance clinical decision making by enabling timely insights into patient care. Bulk FHIR allows for the efficient extraction of large volumes of structured, standardized data from EHRs,[16] enabling registries to collect and manage data in near real time. As a result, providers can monitor patient outcomes more effectively and respond proactively. In addition, this approach helps reduce the administrative burden and costs for providers who submit data to registries manually.

D. Payers

PA-5. What are ways payers can help with simplifying clinical quality data responsibilities of providers?

a. *How interested are payers and providers in EHR technology advances that enable bulk extraction of clinical quality data from EHRs to payers to allow them to do the calculations instead of the provider-side technology?*

b. *In what ways can the interoperability and quality reporting responsibilities of providers to both CMS and other payers be consolidated so investments can be dually purposed? Are there technologies payers might leverage that would support access to real-time quality data for healthcare providers to inform clinical care in addition to simplifying reporting processes?*

To preserve resources for patient care, **payers could respond to the provider community's call for greater alignment across models, minimize reporting requirements within models,** and **foster technology to support reporting**. Although each action would be beneficial on its own, working toward all three together would reduce the noise introduced by the current volume of requirements and amplify the signal of what matters most for providers, payers, and patient outcomes.

Mathematica's research shows the healthcare community has been investing its own resources in harmonizing responses across various payment models. For example, Mathematica's evaluation of a recent alternative payment model found participating practices typically made changes motivated in part by the model's goals, selecting changes that were also aligned with other value-based contracting arrangements.[17] Preliminary findings from a Mathematica study on documentation burden across payment environments similarly show that organizations often develop documentation that meets the combined requirements of multiple models, instead of optimizing for each model individually. Rather than healthcare organizations reconciling different models' requirements on their own, a payer consortium could collaborate with healthcare professional societies to identify the highest-priority areas for clinical quality data and define a core set of related measures, akin to the California Quality Collaborative and the Integrated Healthcare Association's advanced primary care model co-

[16] https://kodjin.com/blog/how-to-leverage-fhir-bulk-api-for-data-extraction/.
[17] https://www.mathematica.org/publications/evaluation-of-the-primary-care-first-model-third-annual-report.

developed by Aetna, Blue Shield of California, and Health Net.[18] Giving payers an opportunity to build on CMS's work[19] and develop their own universal foundation could mitigate the challenges securing multi-payer participation that Mathematica's prior evaluations of CMS Innovation Center models have shown.[20] The resulting set of measures, if adopted across payers and models, would simplify documentation and reporting requirements, ensuring greater investment in related care delivery improvements. This would result in better patient care, health, and well-being.

Even without coordination, payers could simplify providers' clinical quality data responsibilities by minimizing reporting requirements within their individual models. Developing core measure sets independently would not be as impactful as developing them in collaboration with other payers, but it would nonetheless give larger organizations consistency across primary care, accountable care, and other value-based models. Payers could also waive some or all reporting requirements for high-performing providers and for less resourced rural and small independent providers. This process would follow the logic of the Gold Carding program that waives or reduces prior authorization requirements for payers using select providers.[21] Reducing time spent on reporting could free up additional time for patient care, improving accessibility. It would also give providers additional flexibility to invest in performance improvement strategies, knowing they could potentially offset that investment with future savings from reduced performance-reporting requirements.

Finally, payers could invest in technology to support reporting. In the short term, this could include collaborating with health IT developers to host trainings to show practices how to use EHRs and other tools more efficiently. One EHR developer relayed to Mathematica during an evaluation that these learning activities gave them an opportunity to provide guidance to their entire customer base at the same time. The developer explained that having everyone "on the same page" and listening to their feedback helped them improve.[22] Although lengthy offerings may not be as beneficial to smaller healthcare organizations without dedicated reporting staff to attend the trainings, short lunchtime sessions with recordings for delayed viewing could advance workflow innovations that smooth reporting requirements. In the long term, payers could also support the federal government's effort to develop dQMs that use interoperable information exchange to repurpose and integrate clinical and administrative data sources to monitor provider performance without a stand-alone reporting effort.

Payment models directly impact providers' clinical quality data responsibilities. Aligning and minimizing reporting requirements and working with health IT developers to foster more seamless reporting will reduce administrative burden and red tape, translating into more time and energy for providers to focus on patient care.

[18] https://iha.org/news-events/california-health-plan-leaders-unite-for-the-first-time-to-launch-new-payment-model-demonstration-project-to-fortify-primary-care/; https://www.calquality.org/initiative/payment-model-demonstration-project/.
[19] https://www.nejm.org/doi/full/10.1056/NEJMp2215539.
[20] https://www.commonwealthfund.org/publications/issue-briefs/2024/jul/why-primary-care-practitioners-arent-joining-value-based-payment.
[21] https://pmc.ncbi.nlm.nih.gov/articles/PMC10783970/.
[22] https://downloads.cms.gov/files/cmmi/cpcplus-first-ann-rpt.pdf.

E. Technology Vendors, Data Providers, and Networks

3. Technical standards and certification

TD-9d. Regarding certification of health IT: What policy changes could CMS make so providers are motivated to respond to API-based data requests with the best possible coverage and quality of data?

Although we offer a number of suggestions for motivating providers to respond to API-based data requests with the best possible coverage and quality of data, we believe the most effective strategy for improving data quality is to tie these initiatives to programmatic initiatives that actively use these data for decision-making purposes. This feedback cycle tends to drive rapid improvement in the reporting and quality of the underlying data.

Mathematica has worked extensively on quality assurance of data sets and projects. Examples include our long-term work providing quality assurance for the T-MSIS data set, a national Medicaid data asset, and the development of research-optimized T-MSIS Analytic Files (TAF) for Medicaid data. Mathematica supports CMS on a wide variety of programmatic use cases that use these and other data for operating, quality, and program uses. We also support many states in a variety of capacities with data, giving us a unique window into data-set development, from inception, to quality, to downstream uses.

Linking programmatic efforts to particular data sources is a way to rapidly improve their quality or uncover issues that may be undermining quality and coverage. Our experience supporting this recommendation comes from our work to develop and improve the data quality of national data assets such as the T-MSIS data set. T-MSIS was historically known for data quality issues, but those issues have improved steadily over the last decade, particularly in areas where these data were used for public and operational reporting to support program goals. Within T-MSIS, files such as service use, enrollment, and demographics are substantially more complete because they are frequently used.

Other strategies that CMS might consider include the following:

- **Create a standard for endorsing data quality.** We describe some of the ways that data quality might be assessed in the response to Question TD-12. Establishing standard data quality measures for public reporting gives providers a metric to use within their own organizations to assess and improve their data quality. Although this process would initially represent an investment, the overall effect would be to ensure that prior investments realize their full value and would enable broader ecosystem standard metrics by which to assess data sources.
- **Develop a process for providing feedback on data quality.** Creating a means to provide feedback on data quality is an effective way to improve data quality overall. Options include tools that assess data quality at the time of submission or technical assistance that provides feedback on themes, challenges, and how to remediate issues. Data quality initiatives are a relatively cost-effective way to dramatically improve the quality of a data asset to maximize the investment.
- **Tie incentive payments to data quality.** Offering a carrot-and-stick approach like we have seen in quality measurement can incentivize the submission of high-quality data. When data

quality is measured and there are means to earn rewards or realize penalties for its quality, the focus shifts to improving the data.

- **Communicate for long-range planning.** Although improving data quality is a consideration, the underlying factor for some organizations may be a lack of investment in the requested data format due to time and cost constraints. To support long-term planning, organizations investing in technology need firm expectations communicated through contract requirements with clear timelines for implementation.

4. Data exchange

TD-12. Should CMS endorse non-CMS data sources and networks, and if so, what criteria or metrics should CMS consider?

CMS should endorse non-CMS and CMS data sources and networks, establishing some key metrics by data set and making these criteria transparent and public.

With the emergence of so many data sets, CMS can play a key role as enabler of transparency around these information assets. This is key to reducing waste, shifting investment from the creating data states that may have already existed (and adding burden to the system) to enhancing existing data sets or building net new assets.

Mathematica has worked extensively on ensuring the quality of data sets and projects. Examples include providing quality assurance for the national T-MSIS data set for Medicaid. Mathematica also uses a variety of CMS and non-CMS data sources for analysis in its federal and state work.

Today, acquiring access to data assets involves a lot of assessment. It is perhaps most challenging for use cases that require narrow looks at a specific population, such as in a value-based payment context. However, it is also challenging and relevant when deciding whether it's sufficient to acquire an existing data set or build a new one, or when deciding whether it's possible to link data sets. These assessments also often hinge on a strong underlying knowledge of the data set that the acquiring partner may not have.

Government can play an enabling role in establishing criteria to endorse some of the most used and most acquired data sets, streamlining innovation. Toward this end, CMS may want to consider taking the following steps:

- **Endorse data sources in particular categories.** This step will enable the refinement of criteria for endorsement within those categories. These categories might include, for example, claims, EHRs, and Admission, Discharge, and Transfer (ADT) data. Particular attention should be paid to the population or membership files associated with these data sets so that it is possible to answer essential questions about coverage within a region or population. Decisions about which data sets to use are often made based on population coverage and data quality.
- **Consider tiers of validation or endorsement.** The first tier of validation might simply be a technology enabled self-validation, where data submission is validated in an automated way within key categories for expected ranges and values in fields. An additional tier of review could include an ASTP-validated endorsement. A tiered endorsement system would also create a way to recognize and validate the use of common data formats for exchange.

- **Create a standard data dictionary format.** This would be a relatively simple way to encourage transparency regarding data sets. Data dictionaries are critical because they help explain the data elements in the data set, the structure of the data, and the origin of the data elements so that the data can be interpreted properly for use. The data dictionary template may also include key information such as delivery formats and refresh schedule. An exceptionally valuable step beyond a typical data dictionary would be to provide benchmarks for how to review the data. For example, for the category of data source, determining the typical fields makes it clear when a data provider is providing less or more than typical. It also provides some clarity on available and missing elements. Other considerations include what can be expected in terms of the completeness of key fields, which makes it clear whether the data in a particular field is well populated. For example, if a file has 100 expenditure entries, you want to know whether they are available 5 percent of the time or 100 percent of the time (and what availability is typical).
- **Create a means to compare data sets.** Ideally, there would be user-friendly, interactive ways to compare the comprehensiveness of one data set to another. Often, choosing one data set over another means comparing data sets to review coverage network within states, availability of key fields, timeliness of data, and population coverage. A visual tool to compare endorsed data assets would be an industry asset. Mathematica created the DQ Atlas tool to visualize Medicaid data quality and similar concepts for the T-MSIS data set.

Finally, although creating an endorsement process for non-CMS data sets would be an asset, we would encourage the inclusion of CMS data sets. Many highly valuable CMS data sets hold opportunities for greater use, supporting innovation, reduced quality, improved cost, and better patient care. Organizations looking all full population views of healthcare challenges would benefit from being able to identify endorsed data sets covering commercial healthcare, Medicare, and Medicaid populations.

5. Compliance

TD-19. Regarding price transparency implementation:

a. What are current shortcomings in content, format, delivery, and timeliness?

CMS implements two price transparency regulations: one applies to commercial health plans, and the other applies to hospitals. For both regulations, the most significant issue is that the tedious data collection process combined with massive volume of highly complex data consumes too many resources (human and computing) to collect, parse, and clean the data, leaving few resources for in-depth data analytics to help with uses cases for patients and employers. Given the complexity of data, current use of the data is largely limited to comparing rates per billing code, which could support use cases around provider-payer negotiation and economic research (even those are often difficult due to data inconsistencies; see more details below). However, to help patients and employers looking to compare cost, more sophisticated analytics are required to bundle billing codes to services and account for various clinical scenarios, among other things. The high cost of processing and cleaning price-transparency data make it expensive and ineffective to develop user-friendly price tools, thus hindering the development of analytic solutions that truly empower patients and employers.

Major issues implementing health plan price transparency include the following:

1. **Large data size.** A main driver of excessively large data sizes are provider rates that have no practical bearing, or "ghost rates." They are rates for services a given provider does not actually offer and rates for outdated or erroneous TIN–NPI pairs. Another factor that contributes to data size is the high dimensionality of data attributes that result in repeated records over a large number of possible values for data elements, such as service codes and billing code modifiers.
2. **Lack of standardization.** Despite CMS's effort to standardize reporting via required data format and elements, there is substantial variation in how plans report their rates. For example, a mix of provider organization TINs, organization NPIs, and individual NPIs are used to report provider identification, and the pattern varies widely across plans and payers. This makes it challenging to identify organization names and locations. In addition, payer and hospital data are not comparable due to differences in reporting requirements and inconsistent reporting behaviors across payers and hospitals.
3. **Lack of data integrity.** Although research of selected payers and services shows that data patterns at the national level largely make sense,[23] all payers' data show missingness and inaccuracy at the regional and local levels. Some payers report far fewer providers than other payers, and some report rates substantially higher or lower than expected. There is also significant amount of missing or invalid data on required data fields such as plan identifier and expiration date.

As with health plan price transparency data, hospital price transparency data also suffer from lack of standardization and poor data integrity. In addition, many hospitals are struggling to comply with CMS's data requirements, partly because of the low penalties for noncompliance.[24]

b. Which workflows would benefit most from functional price transparency?

For hospitals and payers to achieve functional price transparency, patients need access to clear and meaningful disclosure of costs associated with medical services, procedures, and treatments before receiving the treatment. Executive Order (EO) 14221, Making America Healthy Again by Empowering Patients with Clear, Accurate, and Actionable Healthcare Pricing Information, provides a path toward functional price transparency by requiring "the disclosure of actual prices of items and services, rather than estimates," and ensuring that "pricing information is standardized and easily comparable across hospitals and health plans."

Only with a shared definition of "actual prices" will hospitals and payers have a chance of achieving compliance, consumers be able to actually use price transparency information, and regulators be able to monitor and oversee the requirements effectively. Data standardization that clearly defines "actual price" is an essential step toward making data comparable. Further, prices are most comparable when they are for the same service, including the same set of components and ancillary services furnished at the same type of facility by the same type of clinician.

[23] https://www.ajmc.com/view/cross-validation-of-insurer-and-hospital-price-transparency-data.
[24] Jiang, J. X., Jiang, M., & Bai, G. (2024). Enforcing hospital price transparency: Lessons from CMS actions. *Health Affairs Forefront.*

c. What improvements would be most valuable for patients, providers, or payers, including CMS?

The most recent guidance from CMS for payers and providers[25] demonstrates efforts to make price transparency data more meaningful to all stakeholders. Below we discuss opportunities to achieve further improvement.

For patients and employers, it would be most valuable to see improvement toward developing consumer-friendly price comparison tools, which fundamentally requires standard, accurate data reported by providers and payers. In line with EO 14221, CMS needs to clearly define "actual prices" in its data requirement. Potential options for implementing "actual prices" might include (1) defining the list of services included in the price (for example, listing any ancillary services that are included), (2) differentiating what part of the price is based on the hospital services versus professional services, and (3) defining a time frame during which the actual price is valid.

For payers and providers, it would be valuable to see improvement toward increased clarity in data standard and reduced reporting burden. To achieve this aim, CMS might consider (1) clarifying what elements are required in certain data fields where ambiguity exists, (2) reducing unnecessary data elements, (3) requiring additional data elements to mitigate mixed reporting of different types of rates (for example, whether the rate covers to facility services only, professional services only, or both), and (4) reducing the frequency of plan data updates from monthly to quarterly.

d. What would further motivate solution development?

As discussed, the biggest huddle to meaningful price transparency is currently the lack of data standardization and comparability. Solution development will be ineffective and slow without high-quality data. Implementing clearer data requirement is an obvious solution to address this challenge. In addition, CMS should put robust auditing mechanisms into place to ensure compliance with timelines, data format, completeness, and accuracy.

Providers in certain specialties and geographic areas serve predominantly Medicare and Medicaid patients. However, negotiated prices for Medicare Advantage (MA) plans and Medicaid managed care organization (MCO) plans are not publicly available and remain difficult to access or analyze. To further motivate solution development, CMS could also consider requiring price transparency reporting as part of its existing requirements for MA plans and Medicaid MCO plans.

Lastly, patient-facing solutions are less lucrative than solutions for payers and providers. Therefore, government funding for patient tools will help motivate the development of high-quality data solutions for patients, thereby promoting meaningful market transparency.

[25] See details in "FAQs about Affordable Care Act Implementation Part 70," available at https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/resource-center/faqs/aca-part-70 and "Updated Hospital Price Transparency Guidance Implementing the President's Executive Order Making America Healthy Again by Empowering Patients with Clear, Accurate, and Actionable Healthcare Pricing Information," available at https://www.cms.gov/files/document/updated-hpt-guidance-encoding-allowed-amounts.pdf.

F. Value-Based Care Organizations

1. Digital health adoption

VB-1. What incentives could encourage APMs such as accountable care organizations (ACOs) or participants in Medicare Shared Savings Program (MSSP) to leverage digital health management and care navigation products more often and more effectively with their patients? What are the current obstacles preventing broader digital product adoption for patients in ACOs?

Several intersecting barriers continue to limit ACOs' adoption of digital health management and care navigation tools, particularly in MSSP and other value-based care (VBC) models such as total-cost-of-care arrangements, bundled payments, and capitation models. As outlined in our response to Question PA-5, competing requirements across programs and payers constrain innovation and place disproportionate burden on small, rural, and independent practices, which often lack the upfront resources needed to adopt, integrate, and support digital tools. As noted in our response to Question PR-2, inconsistent underlying data structures and lack of clarity on source-of-record systems also complicate the effective use of tools that must operate within EHR and administrative workflows.

Some of the most significant practical barriers preventing broader digital product adoption for patients in ACOs are application fatigue and data security concerns. Patients are often expected to manage multiple digital platforms to access and manage different aspects of their care—for example, apps for specialty services, separate tools for chronic condition management, and additional log-ins for care navigation—all of which rarely integrate effectively with each other. This fragmentation can reduce patient and practitioner engagement and increase administrative overhead for patients, providers, and ACOs.

To address these challenges, CMS should incentivize ACOs to adopt a "front door" model that uses the existing EHR-linked patient portal as the primary point of entry for digital care management (see recommended CMS incentives below). This model enables patients to access multiple pathways, such as diabetes management or sleep study coordination, within a single, secure environment. Such an approach reduces the need for multiple user accounts, minimizes redundant data entry, and improves usability. Although implementing this model would require an IT investment and coordination across vendors and systems, the resulting infrastructure would streamline access, help mitigate fragmentation, and ultimately, drive cost savings.

From an operational perspective, a portal-centric approach helps ACOs consolidate data to develop a single best patient record within their systems, decreasing the burden of master patient index reconciliation and simplifying back-end integration. It also centralizes support functions, enabling ACOs to provide technical assistance through existing portal infrastructure, rather than across dozens of third-party applications. From a patient perspective, this approach leads to fewer apps, fewer user accounts, and less duplication of data and effort needed to manage their own care.

Critically, this strategy supports patient choice, autonomy, and self-management of health and chronic conditions. When portals serve as access points and identity managers, patients gain greater control over their data, including which third-party apps can access which parts of their health record. This approach puts the patient in charge while still allowing the ACO to function as a single best record across those data sources. The "front door" model is also consistent with CMS's

emphasis on a "single source of truth" in provider directories. It advances broader agency goals to promote interoperability, empower consumers, and facilitate market competition—particularly among third-party application developers that integrate via standard APIs and can compete to deliver patient-facing value through the portal ecosystem.

Although patient-facing fragmentation is a major barrier to digital engagement, ACOs also face significant structural challenges in managing and exchanging data across systems. Interoperability limitations, legacy infrastructure, and delays in receiving patient information continue to impede the broader adoption of digital health tools that depend on timely and accurate data.

Other large obstacles preventing broader digital adoption for ACOs are interoperability barriers and data quality issues. These can be caused by a variety of factors including multiple EHRs in use, limited external data exchange, and legacy data systems such as phones and faxes. Incentivizing ACOs and those who provide data to them to migrate from legacy systems will yield a large return in improved data quality and timeliness of data collection and reporting. Legacy data storage and transmission represent one of the greatest areas for improvement, because they demand manual processing and often introduce data quality errors.

ACOs also benefit from incentives to improve the timeliness of data and to exchange data via modern methods. Many ACOs exchange data in nightly batched exchanges, which introduces lag between when the patient is seen and when the ACO is notified. This can cause delays in updating patient records and makes real-time collaboration or program recommendations difficult to manage. Some ACOs have instituted encounter-based event notifications, which enable the ACO to receive real-time updates when a patient is seen for a given event or condition at a participating provider. These real-time events enable the ACO to generate patient-level follow-up immediately after a patient encounter and provide the patient with tailored program suggestions. For example, an ACO might send an invite to a diabetes education and prevention program immediately following a relevant encounter.

Although real-time reencounter-based events offer ACOs strong value, adoption is not yet widespread. When implemented directly, each peer-to-peer connection requires individual setup, testing, debugging, and monitoring, which adds to ACOs' technical overhead. Some ACOs have partnered with health information exchanges (HIEs) to implement encounter-based event notifications from a number of participating providers via a single connection. This approach greatly reduces the number of connections required, while enabling notifications to flow from more organizations. Because the HIE generates the notification, it is simpler for the HCOs to implement and often requires no additional configuration.

HIE-driven notifications have proven useful for real-time data exchange with ACOs, but this option is viable only when the available HIEs have sufficient provider participation and patient attribution to enable a comprehensive view of patient activity. Another option for ACO real-time exchange is via TEFCA. ACOs can use TEFCA directly through a QHIN or via an HIE that has joined a QHIN. Although TEFCA is not currently used for this type of ACO event notification, it has the infrastructure needed to expand and support this workflow. In terms of reducing cost and implementation effort for ACOs and HCOs, TEFCA represents an optimized path toward meaningful, automated data exchange.

To enable greater adoption of digital tools—both patient-facing and back-end infrastructure—CMS could offer the following incentives:

- **Incentives to support patient-facing digital tool integration**
  - Upfront infrastructure stipends for ACOs to modernize portal systems and back-end API frameworks as an expansion of existing CMS Innovation Center infrastructure payments.
  - Bonus points or scoring preference in MSSP quality or savings benchmarks for ACOs that implement identity-integrated portals that support app-based engagement
  - Reduced reporting burdens for ACOs that adopt tools certified to integrate with EHRs via FHIR-based APIs and patient access endpoints
  - Technical assistance grants or learning collaboratives for lower-resourced or rural ACOs implementing this model
- **Incentives for third-party digital tools that adopt standardized APIs or integrate via single sign-on with ACO patient portals**
  - Grants to help ACOs transition off legacy systems (for example, faxing or batched file transfers)
  - Funding to support TEFCA-compatible technologies and QHIN onboarding
  - Support for HIE-based event notification implementation and technical integration
  - Incentives for timely data delivery (for example, encounter-based event triggers across inpatient and outpatient settings)
  - A TEFCA implementation playbook tailored to ACO workflows

Although major vendors and frameworks already support many of these capabilities—such as API-based integration, single sign-on, event-driven notifications, and TEFCA queries—adoption across ACOs remains inconsistent. Focused CMS incentives and implementation support would help close this gap, particularly for small or under-resourced ACOs, and accelerate nationwide progress toward a unified, patient-centered, data-enabled digital infrastructure that supports VBC.

VB-2. How can key themes and technologies such as artificial intelligence, population health analytics, risk stratification, care coordination, usability, quality measurement, and patient engagement be better integrated into APM requirements?

As healthcare delivery evolves, payment models must likewise evolve to better incorporate novel technologies and care practices. Alternative payment models (APMs) are an opportunity for CMS and the Center for Medicare and Medicaid Innovation (Innovation Center) to support new tools, from the AI and risk stratification algorithms underlying patient- and population health alerts and quality measures to usable provider- and patient-facing technology that support care coordination and patient engagement. **More frequent and higher-quality engagement with health IT developers as APM partners** would result in better integration of these key themes and technologies into care delivery, as would **collaborating with other payers** to harmonize requirements across payment models and **providing financial support to providers and patients** for participation and engagement in these models.

Historically, health IT developers have had a limited role in APMs. Moreover, many models include minimal requirements for participants' health IT use, such as broadly using a certified EHR. In contrast, CMS formally engaged health IT vendors as APM partners in Comprehensive Primary Care Plus (CPC+), a national advanced primary care medical home. Although the model was ultimately not successful, there are opportunities to learn from its inclusion of developers when paired more with its more detailed health IT requirements for participants.[26] Mathematica's work on CPC+ found early engagement gave developers the notice they needed to incorporate APM requirements into their multiyear timelines to design and implement new functions. In addition, formal engagement enabled developers to better identify which of their clients were participating in CPC+ so they could offer more focused support in how to use available features to meet model requirements.[27]

As noted in our responses to Questions PA-5 and PR-2, the number of active payment models can dilute the impact of any single model. Mathematica similarly found in its work on CPC+ that despite partnering with participating practices, developers were in part challenged to make more sweeping changes to their products because a small fraction of their overall business was participating in CPC+ and it was risky to build tools that their other clients may not be willing to invest in.

APMs could further ensure that key themes and technologies are better integrated into requirements by providing substantial, risk-free financial support to providers and patients. For example, as Mathematica noted in a recent study of primary care participation in APMs, signing bonuses would help offset the upfront costs of new technology and workflow redesign.[28] Similarly, models could provide gift cards for patients who meet a minimum threshold of engagement with technology. Models could also waive patient cost-sharing, though patients' exposure to these costs varies by health plan product. Although some APMs currently permit these incentives,[29] making them a more formal part of the program would expand their reach.

Given the rapid pace of technological change, there is a risk that APM requirements calcify technology rather than lay a foundational infrastructure that supports innovation. Continued partnership with health IT developers and other payers would mitigate this risk and better foster a competitive market for novel tools and care delivery strategies while taking advantage of the opportunities for APMs to improve patient care.

VB-4. What are the essential data types needed for successful participation in value-based care arrangements?

The most critical data element for measuring the effectiveness of VBC within Medicaid is the Medicaid ID. However, it can be challenging to maintain continuity of care when a beneficiary relocates to another state and is assigned a new Medicaid identifier. For this reason, we propose the implementation of a persistent, universal Federal Medicaid Member Identifier (FMMI), issued at the state level at the time of enrollment and coordinated through a centralized federal matching and issuing service. This identifier would mirror the Medicare Beneficiary Identifier model and address

[26] For example, CPC+ required practices to use health IT to risk stratify each empaneled patient via an established, health IT-enabled algorithm and then use those results to flag patients identified as "complex" who require care management (https://www.cms.gov/priorities/innovation/media/document/cpcplus-hit-py2021).
[27] https://www.ajmc.com/view/incorporating-health-it-into-primary-care-transformation.
[28] https://www.commonwealthfund.org/publications/issue-briefs/2024/jul/why-primary-care-practitioners-arent-joining-value-based-payment.
[29] https://www.cms.gov/priorities/innovation/media/document/eom-rfa-2024.

fundamental interoperability, continuity of care, and data integrity challenges in Medicaid. By establishing a universal identifier, CMS would advance key objectives of the administration, including reducing administrative burden, streamlining services, and supporting VBC models through scalable health IT infrastructure, enhanced program integrity, and reduced duplicate payments.

Problem statement

Medicaid's decentralized, state-administered architecture introduces persistent difficulties in identifying and tracking beneficiaries accurately across time and geography. States currently issue their own unique Medicaid IDs, resulting in people potentially holding multiple IDs either within or across states. These discrepancies arise from variations in enrollment periods, technical limitations in eligibility systems, or lack of continuity in state-to-state transitions.

As a result, the lack of a standardized identifier has the following effects:

- Impedes longitudinal care tracking and health outcome analysis
- Obstructs real-time data exchange needed for clinical care coordination
- Increases administrative burden and cost for record linkage and reconciliation
- Limits fraud prevention and risk management activities

Although CMS assigns a beneficiary ID for use in TAF, this identifier is not operationalized at the point of care or within state systems, rendering it ineffective for real-time data use cases.

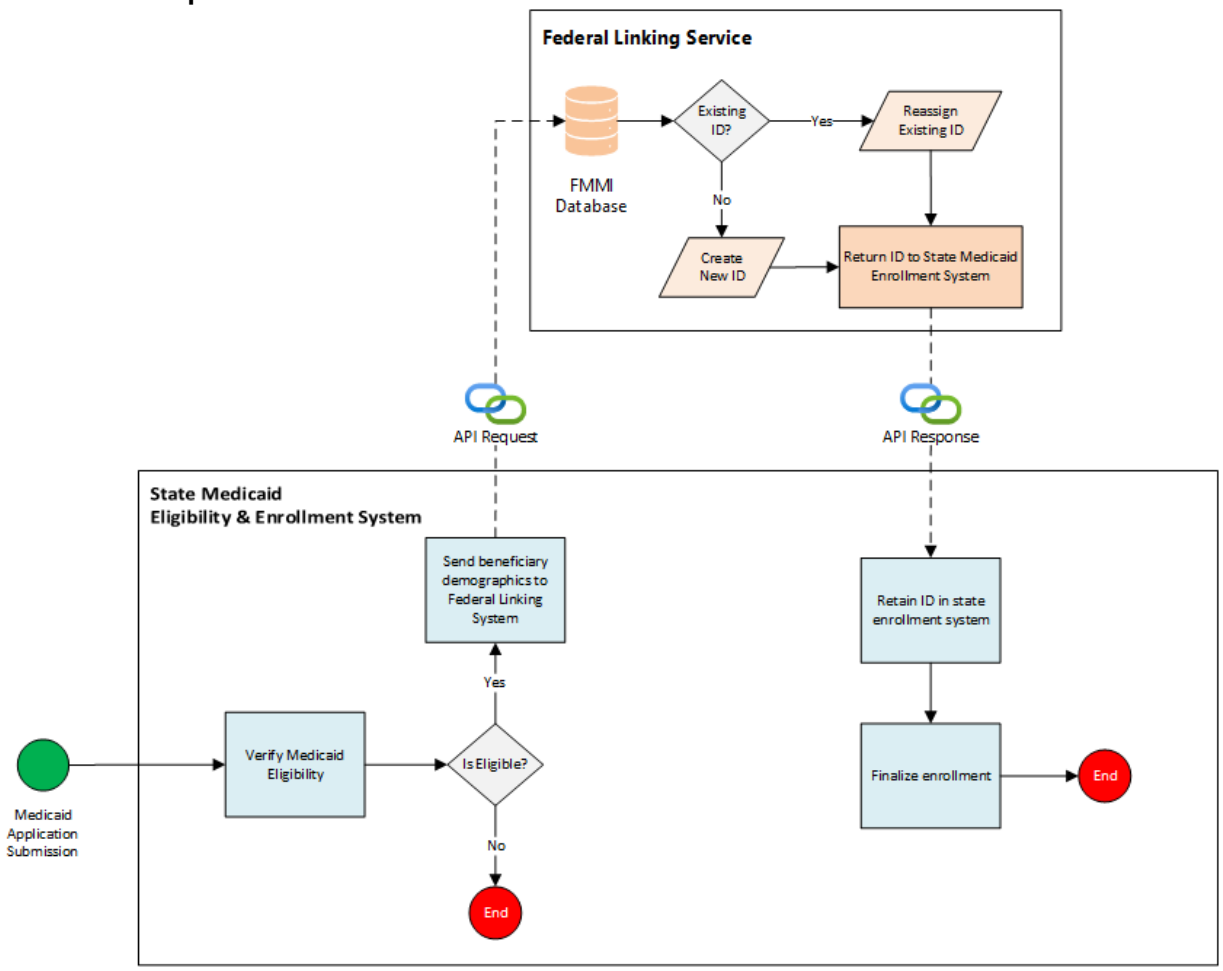
To address this, Mathematica proposes a federally managed universal Medicaid Identifier System with the following key features:

1. **Persistent unique identifier:** This identifier would remain constant across the beneficiary's Medicaid eligibility life cycle, regardless of state residency.
2. **Federally managed linking service:** At the point of enrollment, state systems would transmit a defined set of demographic and identifying information to a centralized federal service.
3. **Real-time issuance or matching:** This service would match incoming data to existing beneficiaries or generate a new identifier if no match is found. The call-response nature of this service would be similar in principle to the credit bureau inquiry model (that is, consumer credit approvals).
4. **Interoperable across programs:** The identifier would support Medicaid, CHIP, dual eligibility for Medicare and Medicaid, and Marketplace coverage coordination.

Key operational considerations include the following:

- States maintain operational enrollment control but integrate with the federal hub via secure APIs.
- Identifier issuance is triggered during eligibility determination or renewal.
- The FMMI is included in all downstream data exchanges, including claims, encounters, care coordination records, and reporting.

Exhibit 1. FMMI process flow



The FMMI architecture (shown in Exhibit 1) provides a standardized, real-time mechanism for managing beneficiaries' identity in Medicaid, eliminating duplicate IDs within states, and enhancing program integrity, longitudinal tracking, and care coordination across state lines.

Benefits and strategic alignment

This approach directly advances CMS and HHS priorities in the following areas:

1. **Access:** Enhances continuity of care for highly mobile and at risk populations, including children and homeless people
2. **VBC enablement:** Enables longitudinal tracking and quality measurement required for VBC models and APMs
3. **Fraud, waste, and abuse prevention:** Minimizes the risk of dual-state enrollment and improves program integrity through accurate identity verification.
4. **Administrative efficiency:** Reduces the need for state and federal entities to perform costly, error-prone record-matching and deduplication
5. **Public health and research:** Enhances the quality and reliability of multi-state population health studies and CMS evaluations

Implementation considerations

1. **Stakeholder engagement:** Success requires strong partnerships with state Medicaid agencies, managed care organizations, and technology vendors. Pilot programs could demonstrate value and refine technical standards.
2. **Phased rollout:** Begin with opt-in pilots among interested states, followed by phased national rollout. Priority populations may be engaged first (for example, people who are dually eligible for Medicare and Medicaid, children, and pregnant and postpartum mothers).
3. **System integration:** Explore synergies with other CMS initiatives such as Blue Button 2.0, Data at the Point of Care API, and TEFCA.

A federally issued, persistent Medicaid identifier would serve as a cornerstone of modern digital health infrastructure. It would eliminate long-standing data fragmentation, enhance Medicaid's ability to support VBC, and reflect the administration's goals of modernization and improved health outcomes. CMS has a unique opportunity to lead in this domain, setting a national standard that fosters patient-centered, data-driven care across state lines and across programs.

We urge CMS to prioritize the exploration and potential implementation of an FMMI as a foundational step in future interoperability and VBC strategies.

3. Technical standards

VB-12. What technology standardization would preserve program-specific flexibility while promoting innovation in APM technology implementation?

CMS should adopt and support an open-source CDM optimized for analytics to enable standardized ingestion, transformation, and analysis of Medicare, Medicaid, commercial, and clinical health data. Unlike standards focused on clinical or transactional exchange (FHIR, USCDI+), this CDM would serve the specific needs of plan- and provider-centered analytics in APMs. The CDM would not replace existing standards but instead act as an analytic overlay, translating disparate data formats into a unified structure that supports VBC operations, monitoring, and evaluation.

By reducing duplicative infrastructure and enabling greater reusability of tools and methods, the CDM supports lean standardization while respecting the range of differences in program needs and provider settings. This approach helps accelerate the analytic readiness of VBC programs while reinforcing CMS's broader goals of interoperability, burden reduction, and market-driven digital health innovation.

Problem

Currently, no unified method exists for harmonizing health data across programs and payers for analytical purposes. Standards such as FHIR and USCDI+ are instrumental for transaction-level data exchange and data capture, but they are not designed to support retrospective analytics, quality measurement, or performance evaluation at the population level. Medicare and Medicaid, for example, publish analytic data in different formats, using distinct schemas and field definitions.

As a result:

- Providers and APM entities must build redundant data ingestion and transformation pipelines.
- Analysts must relearn schema logic across datasets, slowing insight generation and raising cost.
- Time that could be used for care coordination, innovation, or patient-facing tools is lost to back-end reconciliation.

These inefficiencies affect smaller, rural, or resource-constrained organizations, in particular, limiting their ability to participate in and succeed within VBC programs.

Solution

A CMS-supported CDM would offer a scalable solution to these challenges. It would standardize core healthcare data structures and definitions across payers and data sources, providing the following benefits:

- An ingestion layer that transforms data from various formats—FHIR, T-MSIS, MBSF, CCLF, LDS, APCDs—into a harmonized structure
- A modular architecture that enables programs to maintain custom fields, logic layers, and reporting definitions tailored to their operational or clinical context
- A shared data foundation that enables program- and provider-level analytics while avoiding unnecessary rigidity

By creating a common foundation for analytics, the CDM lowers the technical barrier to entry for participating in APMs, reduces redundancy, and supports broader innovation in digital tools and care models.

How it preserves flexibility

CDM design enables standardization without homogenization. Program-specific flexibility is preserved in multiple ways:

- Custom logic layers allow programs to apply unique attribution, benchmarking, or quality definitions on top of a shared base.
- Extensible schema supports program- or model-specific data elements without disrupting interoperability.
- Tailored tools—dashboards, reports, simulations—can be built to address local or programmatic needs even while using a common underlying structure.

This approach enables CMS to promote consistency and reusability while respecting the unique designs of different APMs.

Complementarity with existing standards

The CDM is not a replacement for interoperability standards; it is a natural extension. For example:

- FHIR is ideal for exchanging patient records and clinical events in near real time.
- The CDM enables population-level queries, performance analytics, and trend detection across organizations and programs.

FHIR-based data can be ingested into the CDM through well-defined pipelines, ensuring continuity with ONC-certified technologies while unlocking new analytical capabilities.

This layered approach reinforces existing investment in FHIR APIs, while offering additional utility for improving quality, tracking cost, and analyzing patient outcomes.

Advantages

Implementing a CDM offers wide-ranging benefits:

- **Operational efficiency:** Reduces redundant engineering work and eases onboarding for new models
- **Analytic agility:** Supports faster generation of insights by eliminating schema translation steps
- **Data consistency:** Establishes common naming conventions, improving interpretability and reusability of data
- **Governance and transparency:** Centralizes metadata management and documentation across programs
- **Support for digital quality measurement:** Aligns with efforts to streamline quality reporting and reduce burden
- **Innovation enablement:** Allows private-sector vendors and providers to build tools on a consistent, scalable data layer
- **Scalability:** Enables future expansion to additional payer types, use cases, and digital health products

These advantages reinforce CMS's goals of building shared infrastructure, reducing burden, and enabling competitive innovation in the healthcare ecosystem.

Recommended actions for CMS

To advance this model, CMS could take the following steps:

1. Pilot the CDM within one or more VBC models (for example, ACO REACH) to evaluate feasibility and reduce reporting burden.
2. Convene a stakeholder working group of payers, providers, state Medicaid agencies, and developers to co-design and validate the schema.
3. Develop reference tools (for example, open-source transformation pipelines, documentation, and query libraries) to lower implementation costs.
4. Align performance measure logic and reporting formats with the CDM to simplify data flows and reduce provider workload.

Conclusion

A CDM can significantly streamline how CMS programs transform and analyze data while honoring the operational variety of VBC models. It preserves local flexibility, complements existing interoperability investments, and enables scalable innovation across the Medicare and Medicaid enterprise. By investing in a common analytic foundation, CMS can help unlock a smarter, more responsive health system.

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