



The Rise of Advanced Analytics in Medicaid

Viewpoint Paper



Today's state healthcare systems must meet several key challenges — delivering operational improvements, enhancing health policies and program outcomes, and administering managed care organizations (MCOs). State healthcare organizations need to be data-driven, capable of handling the ever-increasing volume and variety of healthcare data and delivering insights to drive business outcomes.

These healthcare challenges call for advanced analytics. Building an effective analytics strategy requires two critical things: deep technical knowledge and proven experience working with Medicaid systems and initiatives.

Technical knowledge must span the breadth of big data software and hardware, including enterprise-class analytics platforms and information management. The domain expertise must encompass a rich understanding of the Centers for Medicare & Medicaid (CMS)-directed business and technical requirements, the U.S. Department of Health & Human Services (HHS)-oriented data discovery, and professional consulting and support.

In addition to using analytics to power a data-driven organization, Medicaid agencies must seek solutions that protect patient and enterprise information; empower employees and partners to improve productivity and outcomes; and support the transformation to more flexible, hybrid cloud IT infrastructures.

Trending toward analytics

States' Medicaid caseloads are increasing while their budgets remain under constant pressure. To make things even more complex, regulatory pressures and state agency collaborations require interoperability with systems in other programs, departments and states. This means that systems must integrate disparate data sources containing different data types.

In early 2020, HHS finalized two sets of rules¹ that specify interoperability and patient access provisions. These rules govern how providers, payers and technology vendors must design their systems to give patients safe and secure access to their digital health data so they can make better healthcare decisions.

The expectation is that much of this effort will focus on integrating data and transitioning from obsolete to more modern technology systems.

HHS leaders in state and local government have identified many places where analytics improve efficiency and efficacy in clinical and operational areas:

- **Clinical analytics:** Clinically driven areas for the use of analytics include evaluating treatment and identifying best practices, developing evidence-based performance metrics, and tracking distribution and incident rates in populations.
- **Operational analytics:** Key business-oriented uses for advanced analytics include streamlining business processes, prioritizing budget allocations and helping administrators forecast service demands.



As part of this evolution, states will increasingly seek data management and analytic capabilities that enable them to capture and understand greater volumes of data and leverage that information to create positive outcomes for patients and their Medicaid organizations.

COVID-19 has added more complexity to the healthcare analytics landscape. It has created a demand for the integration of administrative claims and encounter data with lab results and clinical data. But there is exceptional value in accomplishing this: That data can be used to identify and target high-risk individuals for interventions — supporting their needs while they shelter in place. Predictive analytics services can also identify potential future hot spots and upward and downward disease transmission trends.

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Interpreting this shift

We believe data management and analytics can positively impact four crucial focus areas for state and local HHS agencies: operations, health policy and program outcomes, MCO performance and program integrity.

Operations

Public health systems are responsible for supporting a variety of business activities and processes. These include answering stakeholder calls, enrolling providers, processing claims and managing appeals, interpreting data and producing information and various reports. Operational analytics provide Medicaid leaders with intelligence related to the cost, volumes and quality associated with these activities.

Health policy and program outcomes

State HHS leaders have a significant responsibility and workload related to the promulgation of health policies and development of innovative programs to support their constituencies. Policy and program analytics

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can greatly improve how HHS handles eligibility and benefits, quality of care and access, delivery systems, outreach and enrollment, plan amendments and program integrity, as well as cost sharing, financing and reimbursement. Policy and program analytics will also vastly improve how state and local agencies measure and enhance program outcomes. These include mortality, discharge and readmission rates, hospital rates and length of stays, patient safety, hospital performance, variation of payments for specific treatments and national trends and regional variations

MCO performance

HHS agencies can leverage advanced data and analytic capabilities to measure and improve the performance of risk-based MCOs.

Sophisticated MCO analytics will enable state and local governments to accomplish several important things: assess compliance with Medicaid managed care regulations; validate measures reported by the MCO; track performance improvement projects and encounter data; and evaluate performance measures and information system capabilities assessments.

Program integrity

In an era of increased business complexity, outsourcing and expenditures, the risk of potential fraud, waste and abuse increases. Program integrity analytics bring a new dimension of unstructured data to bear in uncovering patterns of abuse, inaccurate payments and previously unidentified waste.

A new analytics platform for Medicaid

States require deep analytic capability coupled with cost-effective cloud deployment to gain ground against rising medical costs and increase Medicaid beneficiary satisfaction. Cloud-supported analytics allows for the rapid curation and implementation of state-of-the-art algorithms and applications in a fast-changing environment.

Traditional systems, architectures and approaches to data processing, storage and analytics fall short on the ability to handle the scale, speed and variety of today's data. This has created a technology gap.

Unstructured and semi-structured data — from both humans and machines — accounts for more than 80 percent of all data. Unfortunately, it doesn't fit into the nice rows, columns and fixed schemas required of traditional regional database management. Nor can those databases scale out or handle the high-velocity nature of machine data.

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Public healthcare organizations need newer, more innovative analytic solutions to handle the volume, velocity and variety of information in this new environment. Unstructured or semi-structured data — in the form of email, text, instant messages or log files — adds significantly to the size and complexity of the challenge.

But meeting the challenge is critical: Unstructured data generated by scanned supplemental documentation may be mined to find hidden patterns and trends and offer insights not previously available from claims or electronic health record (EHR) data.

Fortunately, a new generation of analytic capabilities is now emerging. A highly secure cloud and analytics platform can gather information from multiple internal silos and combine this data with a range of pre-integrated data sources, such as clinical data, T-MSIS and third-party data flows. It can then normalize data, combine the known with the unknown, and deliver outcomes and value in new ways.

A platform built on industry-leading technologies will deliver rapid, responsive solutions. A robust system should enable organizations to use the reliable, scalable and distributed cloud architecture for storing, processing and analyzing millions of records to provide actionable insights, recommendations and outcomes. Within a Hadoop programming framework, states can manage data lakes and discover vital information in a distributed computing environment. Big data and SQL capabilities will boost performance and support interactive, real-time analytics.

Medicaid agencies can use a platform like this to access cutting-edge visualization technologies, advanced statistical techniques and natural language processing to better understand patterns, concepts and relationships in clinical and operational environments. Developers can access on-demand cloud capabilities with convenient APIs to quickly create self-service solutions, and agencies can leverage prepackaged and ready-to-go analytic applications.

A vertically integrated solution that can be scaled up or down, with petabyte-scale insights, meets today's rigorous public health analytic and reporting needs. With a robust analytic environment, agencies can drive more positive clinical outcomes — including episodes of care, pharmacy analytics, preventable hospital admissions and re-admissions, alerts, super utilizers (predictive analytics), budget forecasting and potentially preventable complications.

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Enhancing outcomes and success

This type of next-generation analytics environment will offer unique advantages for state and local health agencies, incorporating pre-integrated core data — including plan management systems, third-party sources and clinical data stores.

The model should be supported by managed analytic services, with guided discovery aided by skilled data scientists and Medicaid experts using advanced analytic tools and techniques.

This approach can help Medicaid agencies unlock the value of their data — even when that data is not fully known — and greatly enhance business and clinical outcomes. It also enables a consumable, on-demand analytic environment that requires no up-front investment. Public health organizations gain the advantages of continuous innovation and today's most advanced and vertically integrated analytic capabilities, while paying only for what they need and use.

Enabling CMS strategy

This model for Medicaid-related analytics also directly supports the strategy for the modularization and modernization required by the CMS. Most states need to modernize and transform their analytics platform and will seek a reliable partner for that. States require platforms capable of handling, discovering and delivering vital insights based on large data volumes and data varieties that are being generated at speeds not imagined a few years ago.

To fully realize the potential of these emerging analytic capabilities, agencies should seek a partner who can provide specific, high-end qualities in the following areas:

- **Infrastructure and software platform:** Experience in the design and delivery of analytics platforms
- **Legacy system modernization:** Experience in modernizing and transforming legacy analytics platforms to a modular and flexible platform
- **Medicaid analytics modules and components:** A configurable analytics platform designed with a set of independent prepackaged analytics, or for self-guided data discovery
- **Operations:** Technology that supports business operations and processes — interpreting data, delivering dashboards and producing insights and reports

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States must become more responsible for the health of their Medicaid enrollees. They must efficiently handle many hurdles that relate directly to the pace and volume of medical and business information, the current state of IT infrastructures and the need for greater insights into clinical and operational issues. That will require deploying advanced analytics, including technical knowledge of data management and analytic tools, and deep expertise in CMS-directed requirements.

By deploying more advanced analytic capabilities, and by forging technology partnerships, states can meet the data-driven challenges of today and tomorrow.

¹HHS Finalizes Historic Rules to Provide Patients More Control of Their Health Data
<https://www.hhs.gov/about/news/2020/03/09/hhs-finalizes-historic-rules-to-provide-patients-more-control-of-their-health-data.html>

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