ADVANCED ANALYTICS CAN REVOLUTIONIZE GOVERNMENT HEALTHCARE

For government health agencies, the next era of analytics opens possibilities for improving population health while lowering costs to taxpayers.

Some government agencies, including the Centers for Medicaid and Medicare Services and Michigan Department of Health and Human Services, already use analytics to tackle problems such as fraud detection, but now they're beginning to see how advanced analytics can help improve population health overall. As more data are collected in myriad formats, possibilities emerge for analyzing that information in new ways that result in real benefits including identification of warning signs of child abuse, population segments at risk of disease, and groups that might unintentionally abuse emergency rooms. Armed with such data, health agencies can take meaningful action, setting up lines of intervention to reduce or even eliminate the problems.

"Five years ago, we were able to collect a lot of the data, but really the advancement now has been to collect more poignant data and analyze that," said Ryan Blaney, a member of the Health Law group at the Washington, D.C., office of the Cozen O'Connor law firm. "Data analytics and technology are exploding. Five years ago, a lot of what federal and state governments are doing now didn't even exist."

"They're able to collect real-time data from patients, and that's obviously the most meaningful type of data, because then you can connect to hospitals and monitor patients' health in real time and use that

data to determine and flag when a patient might be at risk," Blaney added. "That ultimately is going to lower healthcare costs."

For example, more and easier technological access provides "better ways for the government to communicate with Medicaid recipients, leading to new and different ways of care coordination, follow-up and preventative medicine," said Catharine Evans, senior healthcare industry consultant at Teradata, a company that specializes in analytics. "These care approaches are some of the basic 'block and tackle' of improving the health of a population."

Advanced analytics clearly has a lot to offer health agencies, but some are still reluctant to use the approach. One reason is that data come from many sources and in many forms, namely structured – names, claims data, medication information and International Classification of Diseases, or ICD, codes – and unstructured, such as doctors' notes. Data also come from disparate sources, such as a Medicare eligibility database or a relational database. All of this makes crunching the data into digestible portions difficult. That's where advanced analytics comes in. It can take those disparate data types and sources and produce something meaningful.

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ADVANCED ANALYTICS IN ACTION: SEATTLE CHILDREN'S HOSPITAL

We can look to the private sector to see an example of how advanced analytics might help government health organizations transform payment structures, provide better care and ultimately drive down the cost of public healthcare. Consider the work of Eugene Kolker, chief data officer at the Seattle Children's Hospital. He has been using analytics to get complete views of health situations that fuel data-driven decisions. The result is better outcomes for both the hospital and its patients.

"We've become better at predicting which patients will pose challenging clinical cases and are at higher risk for deterioration due to their conditions," Kolker said. "We coupled internal and external teams, which proposed different solutions for predicting these cases. Through modeling, simulation, and an A/B comparison, we empowered teams and leadership to make better-informed decisions about how we manage care for those patients."

Additionally, using analytics, Kolker and his team found that patients with at least two chronic diseases make up about 20 percent of the hospital's patient population, but use 80 percent of its resources. By collaborating with the chief medical officer and doctors, he and his team created new standard operating procedures that were adopted enterprise-wide, Kolker said.

Advanced analytics has a role in fraud detection and prevention, too, said Cris Ewell, the hospital's chief information security officer.

Another reason is cost. Analytics is expensive: To accommodate new data formats, health agencies need new solutions to collect, store, manage and analyze them. There are ways of providing health services by studying data that can save taxpayer dollars in the long run, however. For instance, rural localities that use telemedicine to treat patients in places situated far from a clinic or hospital will see improved population health, which will, in turn, reduce Medicaid costs.

"Agencies are trying to take steps to meaningfully use the data, but there certainly is much more that can be done," Blaney added. "A lot is a resource issue. As technology becomes less expensive and as data analytics becomes smarter and easier to do with the development of new technologies, I think that agencies will continue to be able to take advantage of big data in a more meaningful way."

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"I frequently see disconnected data analytics efforts in government, largely due to procurement rules and funding silos," Evans added. "Any data analytics effort is a significant investment and really should be utilized to its full value. As an example, the same data analytic platform which identifies fraud can also be used to enhance population health, care coordination, access to care and payment transformation. Ultimately, a unified approach to data analytics can improve almost every aspect of an agency's mission."

Some government officials have already taken notice of advanced analytics' advantages. For example, the Office of the National Coordinator for Health Information Technology's Policy

"The area of analytics and intelligence is evolving and is much needed for the healthcare industry," Ewell said. "From the information systems side, we use monitoring systems and analytics to detect suspicious behavior from both internal and external sources."

Overall, the hospital uses a simple philosophy for approaching data: PPT. It stands for people, process and technology, Kolker said.

"Data and analytics should align the strategic needs and aspirations of the customers – who are patients and families – and PPT enables that," he said. "We also recommend operating as internal consultants who show the value of data and analytics by co-developing actionable data stories with domain experts, transforming them into advocates of data and analytics, and empowering culture change with better-informed decision making."

The key takeaways for government health officials are staying focused on the ultimate beneficiary – citizens while standing up an advanced analytics process that can do more than generate reports on current or past states. The results should be data that draw a picture of the future so that meaningful action can be taken to get and keep people healthy.

Committee moved closer to issuing guidelines for big data in August 2015. The draft included recommendations that would address policies, security and privacy.

"The application of big data analytics in healthcare brings opportunities to improve the health of both individuals and their communities," Paul Tang, vice chairman of the HIT Policy Committee, wrote in an Aug. 5 letter. "These benefits include safer treatments, the ability to target communities and individuals with tailored interventions, and the ability to respond to the spread of diseases more rapidly."

Additionally, the Health and Human Services Department has established HealthData.gov, a website "dedicated to making high value health data more accessible to entrepreneurs, researchers, and policy makers in the hopes of better health outcomes for all." The site is in line with the HHS Health Data Initiative, which aims to make health data, such as clinical care provider quality information, consumer product data and government spending data, more easily accessible.

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"By opening up our data, the idea is to help catalyze the emergence of a decentralized, self-propelled 'ecosystem' of innovators across America who leverage HHS data to help consumers, care providers, employers, journalists, local policymakers, and others in ways that no one organization could possibly even imagine — let alone build, deploy, and scale," according to HealthData.gov.

Improvements in technology and data are combining to bring advanced analytics to the forefront of government officials' minds. It may still be in its infancy, but advanced analytics promises to grow quickly, paving the way to better health.

PROBLEM-SOLVING POTENTIAL

To better understand the potential that advanced analytics holds for government health agencies, here are some uses cases that illustrate the importance of this new tool.

Layering geographic data with other information

The State of Michigan is applying advanced analytics to help detect and combat lead poisoning in children. To do this, it is centralizing its data in a single integrated data warehouse – a tool that in 2012 saw a return on investment of $1 million per day. Health officials can target prevention campaigns to neighborhoods known to be at risk for lead poisoning. For instance, in Flint, a city currently dealing with high levels of lead in its water supply, officials are creating an app to remind residents of the importance of screening.

"Decreasing lead poisoning is just one of the many possible ways to increase the health of communities. Layering and building multiple different kinds of advanced analytics and then displaying them geographically can reveal amazing, business-relevant insights: What areas are underserved with primary care? Which neighborhood needs additional opioid prevention efforts?" Evans said.

"Analysis of claims, encounter data and provider location data can provide Medicaid agencies vital information to make data-driven decisions, which increase overall health and drive down cost by ensuring that every community has appropriate access to appropriate care," Evans added.

Predictive modeling and real-time assessments

Another state agency that's already using advanced analytics is Massachusetts' MassHealth, which combines the state's Medicaid and State Children's Health Insurance Program and provides healthcare coverage to 1.3 million residents. MassHealth

uses predictive modeling to provide real-time risk assessments to combat scams in Medicaid payments. The system, which went live in May 2013, has helped MassHealth recover $2 million in improper payments, according to 2014 numbers.

The system eschews the traditional "pay and chase" method most states use for processing Medicare and Medicaid claims in favor of software that incorporates predictive analytics and social networking analysis to identify claims that could lead to improper payments.

The software works with the state's Medicaid Management Information System. As soon as a claim passes through the system, the analytics kick in to detect anomalies that might lead to a claim denial.

MassHealth provides a real-world example of how a state government agency uses advanced analytics to save money and cut back on fraud. It highlights how investing in new technology and analyzing varied data in new ways can improve government operations.

Rooting out waste in the ER
To leverage the power of advanced analytics, agencies don't necessarily need new data. Here's how a new way of studying existing data can shed light on possible ways to solve a persistent and pervasive problem: the use of emergency rooms by some Medicaid recipients as a primary care doctor's office. This pattern can drastically drive up costs for governments and result in poorer population health. An analysis that shows the claims leading up to and following emergency room visits can help alleviate this problem by showing the patterns of care that most often occurred before an acute illness led to an ER visit.

As an example, analytics can identify the clusters, or groupings, of procedures most commonly presenting in the ER. Certain ones, such as heart attacks and traumas, are clearly unavoidable. However, the volume of ER visits for patients with chronic diseases like asthma and diabetes can be significantly reduced with proper management.

Analytics can help identify individuals or groups of individuals who may need additional assistance for care coordination and/or access to care. By reaching out and providing better service to the client, governments can not only improve the overall health of those constituents, but also prevent wasteful spending in the ER.

Same data, two missions
Here's another example of how agencies can use the same data sets, and sometimes even the same algorithms they already have, for multiple and diverse purposes that result in new outcomes. To combat fraud, health organizations correlate encounter and/or claims data against common groupings of ICD-10 claims to gain insight into unusual claim patterns, which could signal a problem. The same data and analytic could be used to focus on claims/encounter groupings that could be associated with child abuse to quickly pre-process child abuse complaints.

Whether the goal is fighting fraud, predicting health issues or reducing waste, these examples show how advanced analytics can make big differences regardless of whether the effort involves a big investment. The boon that advanced analytics

provides to improving the public health landscape can't be underestimated, and agencies can't afford to wait to take advantage of its benefits.

HOW TERADATA CAN HELP

Teradata Corp. is an analytics company with more than 35 years' experience, 10,000 employees, and $2.7 billion in revenue in 2014. Its Teradata Aster® Analytics solution is designed to perform exactly the complex analyses that government agencies are beginning to test out today.

By enabling multi-genre analytics, Teradata Aster Analytics can make sense of structured, unstructured and semi-structured data, which is typically saved on web servers in the form of XML or JSON logs.

"The idea behind processing all of this information, which is of various types, in one platform and at scale is typically what big data solutions do, but the advantage that Aster Analytics provides over many other solutions is that it enables people with a variety of technical backgrounds and technical expertise to use this solution effectively for their data solutions needs," said Sri Raghavan, senior product marketing manager at Teradata. "This solution allows people in a variety of roles in their organization to effectively use an analytic solution for their various use cases."

Possible use cases include how to determine the most effective paths to surgery, the risk of noncompliance for insurance adjusters or claims

providers and the long-term socioeconomic impact of population health economics.

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Additionally, Aster Analytics easily classifies doctors' notes, so that practitioners can make quick categorizations, Raghavan said. For example, they can see terms such as "high fever," "aches" and "10 days," and reasonably diagnose a case of the flu.

The advantages of advanced analytics are clear: Government health organizations can save money, reduce fraud and, most importantly, improve the quality of care they provide. The potential is also clear, promising a wealth of possibilities for health agencies to reap benefits. By investing in new technology and studying private-sector achievements like those at Seattle Children's Hospital and best practices from public-sector efforts like MassHealth, agencies stand ready to better meet their ultimate mission of keeping people healthy. ■

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