FROM DATA TO DECISIONS

The Power of Analytics

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PARTNERSHIP FOR PUBLIC SERVICE

IBM Center for
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INTRODUCTION

Batting average isn't the best way to determine the effectiveness of a hitter. The Oakland Athletics learned that while doing statistical analyses of players and trying to build a winning team during their 2002 season. "They took everything that happened on the baseball field and sliced it and diced it to its most elemental parts," Michael Lewis, author of the book, "Moneyball," said in a radio interview. They then upended conventional wisdom on how to win ball games, revolutionizing the sport by looking more closely at the particular factors that affected team performance. Anyone who has read "Moneyball," or seen the movie, learned how crucial it became for the team to rely on data to improve its performance and to learn, for instance, that on-base average was more important than batting average because players can get on base with walks that also help the team score runs. The A's surprised just about everyone with their new-found success on the field, besting teams that had millions more to spend on recruiting top players.

Federal agencies don't field baseball teams, obviously. But they too collect valuable data that tell important stories about how they're doing in carrying out their missions. Virtually every agency collects data but many struggle to turn the information into useful information that can inform and drive decisions. Yet, trends in that data can pinpoint problems, underscore successes and steer officials toward alternatives, and perhaps better ways of carrying out their programs. Agencies that have extracted the important lessons from their data and relied on the information to manage performance have reduced marine accidents, bettered the quality of the care patients received in nursing homes and improved how Social Security services are delivered. The data became useful information that staff relied on to analyze programs and improve results and, yes, sometimes hit the ball out of the park.

Whether agencies have fully immersed themselves in analyzing data, or have just begun the process, some basics have become apparent. If agencies want to improve program effectiveness and efficiency, they need to manage performance, and to do so, they have to measure it. The measures they choose need to be meaningful and linked to a desired goal or result. If ending veterans' homelessness is the goal, for example, a better indicator for success than how many housing vouchers are issued is likely to be how many veterans get into housing.

The clarion call to fix government has put great pressure on federal agencies to manage better and to be accountable and transparent in the process. In the midst of the tremendous fiscal uncertainty the nation now faces, and with public attitudes toward government at an all-time low, it is more critical than ever that federal leaders base

their decisions on accurate data and not on anecdotes, incomplete information or the belief that things will work out for the best—particularly when those decisions have huge consequences on tax dollars and society.

Collecting data is not enough

All federal program managers could run their programs better by analyzing their data, but it takes effort to begin. Even if managers believe it is important and necessary it isn't necessarily easy. Data analysis is not a new concept. Nearly two decades ago, Congress passed the Government Performance and Results Act (GPRA) of 1993, calling on the federal government to manage agency performance better by tracking and reporting key performance measures. To comply with the new law, agencies began developing strategic plans and annual performance plans and reporting annually on results against those plans. But success has been mixed. In attempting to adopt the law's performance management culture, many agencies ended up with exhaustive lists of data and measures not particularly relevant to the program results they sought.

Many viewed performance management mainly as a compliance exercise. Federal managers didn't necessarily analyze the data they reported to unearth the information needed to make better decisions, even though they collected plenty of it from 1998 to 2008, according to Government Accountability Office (GAO) studies.[1] Agencies often lacked the tools and systems for measuring the success or failure of programs and policies, according to The Partnership for Public Service's report, "A Critical Role at a Critical Time: A Survey of Performance Improvement Officers."

Agencies are being asked again to figure out ways to improve program operations. In September 2010, the Obama administration launched the Accountable Government Initiative calling for smarter, better and more efficient government. It emphasizes the value of data, agency performance and results.

Congress updated GPRA in December 2010 to address weaknesses in the original law.[2] Among other things, it establishes in law the positions of chief operating officer (COO) responsible for improving agency performance, and performance improvement officer (PIO) to support the COO. It creates requirements for publicly reporting priority goals to promote transparency and accountability, emphasizes using performance data for making decisions and establishes a framework for government-wide goals. The law requires that agencies develop a limited number of policy and management goals that cut across agencies. Management goals include improving financial, human capital, information technology, procurement and acquisition, and real property functions. Finally, the modernization law reinforces accountability, requiring that a goal leader be designated to coordinate agency staff to achieve each performance goal.

What stories do the data tell?

At the heart of knowing how well an organization or program is performing, and where leaders need to focus greater attention, is analytics. Broadly defined, it is the extensive and systematic use of data, statistical and quantitative analysis and explanatory and predictive models to drive fact-based actions for effective management. It sounds intimidating, but simply stated, analytics is the process of turning data into meaningful information that program staff and agency leaders can use to make decisions. Analytics is a critical piece of performance management, which typically involves establishing goals, monitoring progress with specific measures and making adjustments along the way to improve performance and more effectively and efficiently achieve the set goals.

The Partnership for Public Service, in collaboration with IBM's Public Sector Business Analytics & Optimization practice, set out to study federal agencies' use of analytics and how it helped them achieve better program results. We focused on identifying leading practices that illustrate how data informs decisions and drives meaningful and positive program changes. In particular, we were interested to know how employing good data led to changes in how agencies think about their programs and how it led to programmatic insights that influenced their decisions.

We reviewed seven programs in eight agencies (one program is a collaboration between two agencies) that had experience using analytic strategies and techniques. We looked at three in depth and took some lessons from four others. We focused on mission programs in agencies to illustrate how using analytics can lead to beneficial changes that help agencies meet program goals. We believe the techniques these agencies have used are transferable to other agencies, regardless of previous experience using data.

The four agency programs we examined in greater depth are: the Department of Housing and Urban Development (HUD) and Department of Veterans Affairs (VA) jointly administered Veterans Affairs Supportive Housing (HUD-VASH) program; the Safety Management System (SMS) in the Federal Aviation Administration (FAA); and the

1 U.S. Government Accountability Office, *Government Performance: Lessons Learned for the Next Administration on Using Performance Information to Achieve Results* (Washington, DC: 2008), GAO-08-1026T.

2 Government Performance and Results Act Modernization Act of 2010, P. L. 111-352.

Department of Health and Human Services' (HHS) Center for Medicare & Medicaid Services (CMS) Medicare Program, specifically the nursing homes and transplant programs. We highlighted compelling programs from four other agencies. They include: Coast Guard's Business Intelligence system (CGBI); the "Click It or Ticket" campaign by the National Highway Traffic Safety Administration (NHTSA); the Department of the Navy's Naval Aviation Enterprise (NAE); and the Social Security Administration's (SSA) use of mission analytics in customer service.

The programs we reviewed show agencies at different stages of maturity in using analytics and illustrate the continuum of progress of agencies as they journey from collecting to analyzing data for use as an integral part of managing their program.[3] Some agencies, such as NHTSA and SSA, have decades of experience using data to set goals. Others, such as HUD, are newer in the data arena but now are implementing agency-wide analytics programs. But at all of the agencies we reviewed, regardless of the level of sophistication in their analytics programs, data analysis helped provide insights into how to improve programs. And, all of them found they needed to change agency culture to take full advantage of an analytics mindset.

In addition, we learned that data is only the starting point. The data needed to be analyzed, turned into information and made accessible to staff and executives, and the data also needed to meet varying needs and be understandable to different audiences. The value of the data came from the stories it told. Agencies also had to develop meaningful performance measures to assess progress on how far they were in achieving their program goals. We found that those measures changed over time and it was important that they stay meaningful and reliable and are tied to results. The agencies we highlight had certain practices in common that they used to gather data and turn the information into knowledge that improved their program results:

- Leaders focused on transparency, accountability and results.
- Staff had a clear line of sight from where they stood to the desired goals and outcomes.
- Agencies invested in technology, tools and talent.
- Agencies cultivated and leveraged partnerships across the agency and with partners who deliver services.

Finally, we discovered that some agencies may be derailed by myths that surround the process of analytics and measuring results, and it is important to debunk these myths.

3 Analytics maturity refers to the extent to which an organization uses analytics for making decisions and the level of sophistication of the analytic approaches or tools applied. Common elements for assessing maturity include the quality and accessibility of data, organization-wide focus, leadership involvement, tools and technology, and staff talent.

IMPORTANT ELEMENTS FOR USING DATA TO DRIVE DECISIONS

Leading the way on accountability and results

A cornerstone of successful performance management is support from leadership and good use of analytics, according to the officials and staff we interviewed. Leaders are focusing on continuous improvement and using performance information and measures to identify problems, assess progress and share information and results. And, leaders play a critical role in communicating a clear vision, setting expectations and calling for accountability for results. "A prerequisite to performance management is leadership's commitment to making decisions using analytics," said David Zlowe, performance improvement officer at VA. "The other is transparency and involvement and then accountability to the public."

Leadership also needs to hold staff accountable for using data to manage performance and to achieve progress on goals, senior leaders told us in interviews. A recurring theme was how important it was for leaders to set clear expectations for the executive corps, and that those expectations cascade down to program managers. CMS is an example of how the administrator's expectations, in this case for meeting Medicare goals, flow down to senior leaders, who then tailor them for program manager staff.

Leaders also need to demonstrate how performance management matters in day-to-day work, according to Estelle Richman, HUD's acting deputy secretary and chief operating officer. "Executives need to lead by example and model behavior," she said. At the same time, they must show that staff can talk openly about what the data shows. "They need to help staff to feel comfortable that the data will be used to help improve a program and not be used as a weapon."

While leadership is important, our look at agencies' data use revealed that an analytics program doesn't have to start at the top. It can start anywhere in an agency. The Air Traffic Organization (ATO) within FAA, for example, developed a safety management system focused on managing risks that the agency's top leadership has endorsed and that now is being implemented agency-wide.

Focusing on transparency

The agencies and programs we reviewed all had leaders focused on transparency and used information not only from their programs and agencies but also from partners who delivered agency services. For example, HUD and VA officials attend meetings where they jointly review progress on goals they set for housing homeless veterans, using data to candidly assess problems. Leadership and agency staff look for causes and solutions together, openly communicating results and working with delivery partners to make changes.

The transparency at CMS, where leaders strive to promote data openness, extends to the public. Data on Medicare-funded nursing homes on its Nursing Home Compare website not only is open to staff, delivery partners and stakeholders, but families also can use it to compare nursing home facilities. Opening that data to so many stakeholders has led to more valid and reliable information and has led to changes that have improved the quality of nursing home care. Similarly, the Coast Guard has found that by opening its data, via the Coast Guard Business Intelligence system, staff can point out data problems, helping the agency improve and refine it.

Leaders play a critical role in communicating a clear vision, setting expectations and calling for accountability for results.

Getting from here to there via a clear line of sight to goals and desired results

Some of the "aha" moments analytics provide come from staff members understanding that good use of data has the potential to enhance mission and programs and that simply complying with reporting rules does not. When agency staff had a clear vision of possible program results and the role they played in reaching those results, they tended to be more enthusiastic about buying in to an approach that involved analyzing data and tracking agency progress against set performance measures. In fact, understanding how their work affected their constituents and the public appeared to fuel a passion and energy for their work. When data analysis and performance measures lead to successful results, staff become more vigilant about revising data to keep the information valid and reliable to assist the agency in reaching important goals.

For example, a program jointly administered by HUD and VA, called the HUD and Veterans Affairs Supportive Housing program (HUD-VASH), set a goal of reducing the number of homeless veterans. By sharing data and working together, staff began to rethink the program measures that were intended to lead to housing the veterans, leading to changes in those measures. The shared commitment to veterans has helped break down silos separating departments, unite staff in both organizations and build trust around measures for improving perfor-

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Using data to gauge readiness for missions: The Coast Guard

The Coast Guard relies on its Coast Guard Business Intelligence system (CGBI) as the basis for sound decision-making. Using data from many sources, staff of marine safety and inspection programs can more easily identify trends and problems and better manage marine accident cases. Staff can make sure adequate resources are devoted to port, waterway and coastal security without neglecting traditional missions such as marine safety and fisheries enforcement. Operational planning managers have found that the system makes data on performance and on the use of resources more readily available to managers at all levels and in general made them more aware of the importance of being in alignment with leadership's direction. "It's fundamentally changed how the Coast Guard thinks about what it's doing," said a program official.

CGBI was created in 2006 from several existing systems and expanded in 2009. It pulls data from 43 separate Coast Guard computer systems that house the data and also connects to dozens of others with useful information, including the Department of Defense and the National Oceanographic and Atmospheric Administration, as well as commercially available data. The business intelligence system turns data into easily accessible information available to anyone who signs in once, with no need for staff to remember multiple, complicated passcodes for different databases. It is updated nightly and tracks results on programs and measures that GPRA requires.

Staff can assess various aspects of their programs, by slicing and compiling information in various ways to observe patterns and trends. They can use standard sets of reports and create scorecards or do more complex data manipulation and analysis using CGBI "cubes," or multi-dimensional representations of the data. In addition, users can look at their personal readiness, such as their health, dental and training information, to check they have met the requirements to go on a mission. They also can look at unit performance and agency-wide information to view how well their unit is achieving performance goals compared with others. The availability of the information has helped improve data accuracy and validity. With many users able to spot discrepancies, action can be taken to correct data at the source. This information transparency has helped strengthen focus on improving performance to achieve the Coast Guard's goals. "Transparency of information breeds self-correcting behavior," said Admiral Thad Allen, former Commandant, U.S. Coast Guard.

mance. Staff working together now understands the interconnectedness of the agencies and the partners who deliver services and how much all contribute to results.

In implementing the Safety Management System, the FAA has been breaking down stovepipes that compartmentalized information needed for aviation safety. The agency needed to look at safety as a complete system, since hazards generally occur as a result of the interaction of individual components. Everyone needed to look more broadly at how agency functions worked together and see their functions as part of a whole to solve and prevent safety issues.

CMS' Medicare program has been data-focused for some time. But the agency's late-1990s transformation to a public health agency, from what essentially was an insurance program, brought about a major shift in program emphasis from surveys and regulatory compliance reviews to health outcomes involving the quality of care. Today, how their work affects public health is evident in talking with Medicare staff, who speak with fervor about patient outcomes.

Agencies don't have to start an analytics program on a grand scale. They can begin benefiting from using in-house systems and commonly available desktop software and grow their programs as they gain experience in performance management.

And, it is shared across their delivery partners. Decisions are tied to data and staff work with states, providers and stakeholders, all with a focus on the quality of care.

Drawing on technology, tools and talent through data wizardry

The tools and technology various agencies use to glean information from their data vary widely in sophistication. State-of-the-art tools are likely to afford the most in-depth analysis of data, but progress also can be made using existing software programs, such as computer spreadsheets. The tools aren't as important as the insights they foster through analysis and discussion. "It's about the conversation," said Zlowe. "The tool is secondary."

Agencies don't have to start an analytics program on a grand scale. They can begin benefiting from using in-house systems and commonly available desktop software and grow their programs as they gain experience in performance management. For example, HUD integrates and compiles various data for performance management meetings on a commonly available computer spreadsheet while it is developing business intelligence capability that will allow users to drill down into the data in more complex ways. The VA has an effort underway to move the performance management process from "pen and paper," said one program manager, to a real-time, web-based system.

Agencies, such as the Coast Guard, that use higher-level technology tools, make data accessible to users throughout the organization and they can customize it in various ways. To build acceptance for using data, it is critical that agency staff

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Using analytics tools to reduce flight costs: The Navy

More than a decade ago, the Navy's Naval Air Forces Command found that the cost of flying planes was rising more than 10 percent annually. The Navy was rich in data but it lacked analytical tools for easily determining the reasons behind the cost increase and for understanding the interconnectedness of its commands.

In 2004, the Navy created the Naval Aviation Enterprise (NAE) to better coordinate activities across nearly 40 major commands and understand how each contributed to the goal of being ready to fly on missions. It enabled the Navy to examine overall the type and amount of training aviators needed, the pilots, planes and fuel necessary, and the costs for repairs and contracts.

The Navy focused on linking performance to the budget, broke down the disconnected approaches to looking at costs and made sure performance measures focused on mission readiness, its desired result. Once it assessed costs per flight across the commands, including airplane maintenance, parts, fuel and training time, the agency could pinpoint areas for cost-savings. And, once the cost information was shared with stakeholders—from budget analysts to maintenance technicians to pilots—everyone could understand how to make more fiscally responsible decisions.

The Navy supported the culture shift to information-sharing through strategic communication, advocacy by senior leadership and an organization-wide training curriculum. The Naval Air Forces Command now knows exactly how much each flight-hour costs and staff can explain to the chief of Naval Operations what resources it needs. Costs for naval aviation have remained relatively flat since 2005. Aviators are trained more efficiently and staff is more focused on the goal of being ready for the next Navy mission, whatever it may be, officials told us.

members have user-friendly access and training on how to use systems for their individual programs. To the extent that agencies can link existing data systems and offer program staff and decision-makers different ways of looking at and getting reports on the data, a performance management approach driven by data can gain a strong toehold in the organization.

Staff with good analytics know-how is critical for helping agency employees navigate the data. These analytics staffs translate data, build models and analyze data, making the information understandable for the rest of the organization. Program staff members who are not analytics experts are more likely to use data and program information that is easily accessible, understandable and tailored to their needs. CMS, for example, has 20-plus years of survey data and 10-plus years of clinical data and has benefited from increasing its analytics staff, which translates a database that originally was designed to capture administrative survey information and now is used to monitor health care programs and results. Program managers are able to access data and pull reports from the web on their own, using web-based tools built by the analytics staff.

To build acceptance for using data, it is critical that agency staff members have user-friendly access and training on how to use systems for their individual programs.

The data challenges

While using data well has many advantages, it also can present significant challenges. Figuring out ownership, making data available and maintaining data integrity are all issues that arise in the analytics arena, agency representatives told our interviewers. For example, one FAA aviation safety system links dozens of databases, yet the same data can have different meanings. The agency is working to standardize definitions and automate data collection to reduce delays in providing reports and decrease potential errors from multiple entries of the data.

HUD and VA hit bumps when blending their data. They found that their data on homeless veterans yielded different numbers for the same population, due to how the information was collected. The agencies were able to agree on one methodology and dataset to assess progress more consistently against the goal of ending veterans' homelessness.

Partnering with important players to mine and use data

Back in the mid-1980s when people were still driving Chevrolet Chevettes and Volkswagen Sciroccos, the federal government worked with states and localities to increase the use of seat belts, knowing from data that seat belt use saved lives. Federal agencies often work with other agencies, states and localities to serve the public, as well as partnering with providers, such as public housing agencies. In many cases, agencies don't have direct control over results, such as getting more veterans into housing, yet still are re-

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Analyzing data for a faster, more accurate claims process: The Social Security Administration

Facing an ever-increasing demand for services, the Social Security Administration (SSA) uses a rich system of analytics tools it has been building since the mid-1970s to improve customer service and create a faster, more accurate claims process for millions of Americans. Customer satisfaction is gauged through surveys, call monitoring and web page traffic analysis, and business intelligence tools are used to mine the data, identify problem areas and help program staff strategize to improve performance. Staff wants to know how easy the agency's services are to use, the demographics of people using them and at what point customers give up in their attempts to get them. The agency is informed by the data in a real-time, continuous and consistent way.

Sophisticated surveys are tailored to specific services and methods that customers are using, and the agency gathers feedback throughout customers' experience, helping SSA target problems. "We look at every problem area and every opportunity for change based on hard-core analytics," said Ron Raborg, deputy commissioner for Quality Performance. The agency is working to improve the customer experience with its 800 number and an agency priority goal is to increase use of online services for retirement, disability claims and other benefits, to provide more cost effective and timely service. The challenge is that the public generally is pleased with office services and people seeking benefits often prefer to talk to someone in person.

To increase comfort with technology, the agency is exploring providing chat sessions and live online agents to help process electronic claims, smartphone applications for simple services and exit surveys at kiosks in field offices to provide real-time feedback on services. SSA is looking at workload levels nationwide to make sure enough staff is available when and where it is needed most. It also is building policy requirements into the electronic claims process for beneficiaries to reduce errors that can delay benefits. And, it has developed computer-based predictive models to help reduce the disability claims backlog.

sponsible for the results their partners achieve. What distinguished the agencies we focused on was their ability to build effective collaborations with partners and stakeholders, share data and use analytics to improve results.

Sometimes partnerships involve withholding federal funds based on the data, or using law enforcement to reach the desired results, as NHTSA's "Click It or Ticket" program shows. Similarly, at CMS, where many program goals are also laws or regulations, the agency holds back funds for noncompliance. However, these collaborations have also meant working with partners and stakeholders to problem solve and collaborate on public education campaigns. That is what CMS did with Advancing Excellence in Nursing Homes, a coalition of nursing homes, consumers and professionals, undertaking a campaign by the same name, to help nursing homes improve the quality of residents' care and their quality of life.

Partnerships also increase agency knowledge. For example, government and industry aviation experts contribute their judgment and complex data analyses to help FAA understand trends and to drive policy, and stakeholder teams that FAA forms assist in identifying potential safety issues and ways to address them. One such team is the Commercial Aviation Safety Team, which has set an initial goal of reducing fatal accident risk by 80 percent, a goal that it has met, according to FAA program officials.

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IN FOCUS

Relying on data to change behavior and save lives: The National Highway Traffic Safety Administration

Thanks in large part to the National Highway Traffic Safety Administration's (NHTSA) "Click It or Ticket" program, seat-belt use in the United States reached 85 percent in 2010, up from 11 percent in 1985. NHTSA had evidence as early as the 1980s that seat belts saved lives, but it did not have the authority to decree seat-belt use. And, despite public education campaigns at state and local levels, most of the public was not swayed to buckle up. Use didn't start to increase significantly until NHTSA began to encourage state and local governments to implement and enforce seat-belt laws and complemented these efforts with national public safety messages warning of penalties.

The agency's long-term strategy was based on education, laws and enforcement and, through a series of demonstrations and evaluations, the "Click It or Ticket" program was born. Public safety education alone proved ineffective and laws requiring people to fasten their seat belts increased use to only about 40 percent. But media campaigns highlighting enforcement rather than safety, combined with good enforcement, proved to be the winning combination. To get state and local partners on board, NHTSA conducted controlled experiments on motivating people to change their behavior. The results were measurable and showed an increase in seat-belt use that convinced states, law enforcement and eventually the country that seat-belts save lives.

The innovative collaboration among federal, state and local governments, law enforcement and advocacy groups was first piloted statewide in North Carolina in 1993. Within 10 years, 43 states were participating and seat-belt use increased to 79 percent. Since 2005, states have been eligible for millions of dollars in incentives if the rate of seat-belt use reaches 85 percent, or if they adopt a primary seat-belt law, that is, one that allows police officers to stop motorists for that violation alone. By 2011, 32 states and the District of Columbia had primary laws in effect and 17 states had secondary laws, which allow for ticketing once a driver is stopped for another offense. Only in New Hampshire is it legal for vehicle occupants over 18 to ride without a seat belt buckled.

DATA FOR DECISION-MAKING

FOUR FEDERAL AGENCY EXPERIENCES

The following profiles—on CMS' Medicare program, the housing program for homeless veterans run jointly by HUD and VA, and the safety management system at FAA—illustrate how federal agencies are using data analysis to save money, improve services and more effectively achieve their goals. We showcase agencies with a range of missions, which fall along the continuum on how deeply they've immersed themselves in the use of analytical tools, and we highlight successes other agencies will find useful. The purpose is to share what has worked and what hasn't, and how these agencies are navigating their analytics journey, with the understanding that potent examples can help and inspire other agencies.

CMS' MEDICARE PROGRAM
IMPROVING THE QUALITY OF CARE

Sculptures of everyday people top majestic columns in the lobby of the Centers for Medicare & Medicaid Services (CMS), serving as constant reminders to employees that their work contributes to the health and well-being of Americans. As the largest purchaser of health care in the United States, the size, scope and reach of CMS are enormous. The agency pays about one-third of the nation's health expenditures—about $800 billion in fiscal 2011—and touches the lives of more than 100 million beneficiaries in its Medicare, Medicaid and Children's Health Insurance Programs.

Over the past two decades, CMS has metamorphosed from serving primarily as an insurance agency to becoming a public-health agency focused on high-quality care for recipients, delivered in an efficient and timely way. The transformation was sparked by numerous factors, ranging from regulations to agency leadership decisions to actions taken in response to congressional oversight. Congressional concern and critical reports by GAO, the inspector general and the press in the late 1990s led the agency to reexamine how it collected data and measured its efforts, and increasingly, to use data to inform decisions on care.

The agency's mastery of huge amounts of data, and increased transparency, have helped the agency reveal important health care information and trends that have led to improvements in care, such as the reduction in frequency of bed sores. "There was a concerted effort to report data regularly and publicly by regional areas," said Harriet Rubinson, the agency's PIO. "We matured from 2000 to 2007 in our use of performance information and that maturation has continued and intensified." The agency is better able to manage its programs and the administrator, chief operating officer and program managers have increased their focus on using performance measures, Rubinson added. CMS establishes policy for the federal Medicare program and administers it through its regional offices, working with state health care agencies and partnering with states, advocacy groups and other organizations to achieve health care outcomes.

The CMS model illustrates the power of developing and using strategic and performance plans to drive results. The agency stands out in how it uses GPRA measures and how performance goals are reflected in the performance plans of senior executives and program managers and then cascade down to staff. Agency executives use measures to drive performance throughout the agency. The results include nursing home patients who are more comfortable and in less pain.

CMS undergoes a cultural shift for better patient care

When CMS' emphasis was primarily administrative, it focused more on complying with regulations, the number of surveys completed at nursing homes, hospitals and transplant centers, and the staffing numbers in relation to workload, instead of how well patients were taken care of. Now, the agency mines the data it collects to look at clinical trends in health care quality, and it can use

MYTH: AGENCIES NEED THE LATEST TECHNOLOGY TO BE SUCCESSFUL

It's not necessarily about the tools—it's about the process of analyzing data. Technology is only an enabler. Agencies can build successful analytics programs with readily available desktop software. "The tool is secondary," said PIO David Zlowe at VA. "What matters is leadership's commitment to make decisions using analytics." While robust and sophisticated business intelligence tools provide opportunities to view data in many ways, as well help to expand the use and acceptance of analytics, agencies can successfully use and grow their capacity to analyze data without these tools.

that data to direct scarce resources and intervene where it will have the most impact on improving care.

The change did not happen overnight. It required a cultural shift at the agency toward accountability and data-driven performance. And, as each new law or regulation passes, from this administration's health care law to GPRA updates, CMS continues to refine and improve data quality and measures. The agency's reports to Congress now reflect its emphasis on measurable public-health results.

An example of the use of data to measure program performance is CMS' assessment of how often physical restraints are used in nursing home care and how frequently patients develop pressure ulcers, or bed sores. These are tied closely to how well Medicare beneficiaries are cared for overall, so lessening those factors by using them as part of performance measurement, has become a program goal.

The agency reaches those types of decisions using data and staff and provider knowledge, cross-agency analysis and by tapping stakeholders and medical experts as necessary. They collectively review the data, brainstorm on issues, develop action plans and publicly report information, which has led to improvements on key measures, such as those described above. "There is a deep commitment to performance improvement," said Michelle Snyder, CMS' deputy chief operating officer. "How do you identify the right things to measure in the organization?" asked Snyder. The data helped the agency establish baselines for what it wanted to measure and allowed it to use the information to evaluate and manage its programs.

Mastering mountains of data

One of CMS' biggest ongoing challenges is how to turn mountains of data into usable information. For example, the agency conducts 100,000 on-site surveys annually, including visits to health care facilities when it receives complaints from the public about providers. In addition, nursing homes report clinical data at least quarterly on more than 1.5 million residents in about 15,800 nursing homes nationwide. That enormous quantity of data contains many kinds of information from various types of health care facilities and a range of sources, including states and health care providers that all have their own separate systems. It remains a challenge to get the systems to talk to one another and to be able to analyze data across systems. However, the agency has found that data validity has improved as more information has been made accessible to health care providers and the public. Health care providers now understand the advantage of accurate reporting and CMS is capturing more data.

Data analyses have grown in sophistication as the tools, technology and staff for collecting and tracking data has advanced. Congress mandated that CMS develop a standardized clinical assessment for nursing home residents more than 20 years ago, but the agency's information was in paper form until 1998, when Medicare adopted an electronic payment system and mandated that every health care facility use it. Other reporting systems also have come into the 21st century, helping to provide information to make better health care decisions.

On-site surveys on medical conditions and medicines prescribed are data intensive, and it can be daunting to manage the data collected and to ensure consistency. Taking the long view on improving health care and identifying trends, the agency is pushing to get nursing homes to use CMS data and the data they collect themselves to better target their surveys and interventions. Technology will greatly assist in the effort. For example, using laptops or tablets will allow those conducting surveys to glean information from the data as they collect the information and help create a more standardized process.

The power of open data: nursing homes compete for patients

Three years ago, the CMS administrator requested a rating system for comparing the quality of care among nursing homes, leading to the development of the "Five-Star Quality Rating System," whose results are published on the Nursing Home Compare website. The agency developed the five-star system by combining ratings on health inspections, staffing and quality measures based on 10 important aspects of care, such as how well a nursing home helps people keep their ability to dress and eat or how well it prevents and treats skin ulcers. The data on quality measures can be compared across

MYTH: EVERYTHING NEEDS TO BE MEASURED

Some agencies have hundreds of ways of measuring performance, but it's not the number of measures that are important, it's making sure measures are meaningful and valid and are core to accomplishing the mission. Using fewer measures, but ones that are specific, relevant and timely, is more useful for reaching mission-critical objectives. "They think that collecting it [metrics] means something, but it's the analyzing that means something," said COO Estelle Richman at HUD.

facilities nationwide and reflect factors that influence quality of care, according to the agency's research. The health-inspection data includes three years of on-site surveys and visits, comprising about 200,000 reviews. Those ratings on Nursing Home Compare allow consumers to compare nursing homes within each state and make informed decisions about where to place their loved ones. Equally important, the data transparency pushes nursing-care facilities to strive for improved quality and report their data in a timely and accurate fashion. "Public reporting has had an impact," said an agency program manager. "Nursing Home Compare has changed what we measure and analyze."

As mentioned, how often patients are restrained is a useful measure of the quality of patient care. After CMS shared data with delivery partners, changed policies and provided education on the proper use of restraints, their use decreased. The agency then was able to focus on providers whose performance was lagging. Between fiscal years 1996 and 2009, the prevalence of restraints declined from a baseline of 17.2 percent to 3.3 percent. "We firmly believe that collecting and presenting the data to state health departments and nursing homes was instrumental in reducing the rate," said an agency program manager. "We have seen significant reduction in the rate of restraint use over time due to interventions and our work measuring and monitoring the rate."

A different strategy was needed to reduce the frequency of pressure ulcers, according to Thomas Hamilton, director, Survey and Certifications Group, CMS. The agency teamed with states, regional offices and quality-improvement organizations to educate facilities, working closely with the Advancing Excellence in America's Nursing Homes coalition. Protocols were changed so that providers must do skin evaluations when patients are admitted, keep patients mobile and monitor moisture levels. The rate of pressure ulcers has declined from a baseline of 8.6 percent in 2007 to 7.6 percent in 2009. Having a clear goal helped rally stakeholders, change practices and improve patient care.

One of the Medicare program's highest visibility programs is also one of its smallest: organ transplant centers. CMS uses data to increase survival rates and maximize the number of transplants done. More than 240 hospitals are certified to manage nearly 800 organ transplant programs. Each organ type, such as heart, lung, kidney or liver, has its own program, and each program must conduct at least 10 transplants per year for the organ type to remain certified. Performance expectations were built into the Transplant Center Program's regulations, using data from the Scientific Registry of Transplant Recipients.

The system tracks donor, recipient and organ information, and calculates expected results adjusted by risk. It also measures whether a program is in compliance with national organ and patient survival rates. A program out of compliance with quality standards twice within a specified time period is put on a termination track. Programs have 90 to 210 days, depending on the citation, to correct deficiencies or they enter a legally binding, year-long agreement to improve. The agency works closely with hospitals as they overhaul their programs during that year. Most agreements require expert peer review, detailed action planning and on-site consultation. Program operators who have learned to use the transplant system's data to measure their operations have increased staff, bought new equipment, changed protocols and sometimes removed staff on the road to improving their programs. Ninety-three programs have undergone these in-depth reviews since 2008. A smaller number have shut themselves down before being terminated by the Medicare program.

Smart decisions based on more than anecdote

Now that CMS has learned how to use good data to make decisions, knee-jerk responses to performance issues do not carry the day. For instance, if a transplant facility cites poverty as a demographic reason that patients aren't surviving, the agency can call up data to demonstrate that the facility's patient population is not unique and other programs with low-income patients are able to comply with the regulations and produce good results. "The programs have anecdotes, we have the data," said an agency program official. As the agency continues its transformation from insurance to public-health agency, staff knows that the ultimate goal is improving health care quality and that compliance, collaboration, data and transparency are the means to that end.

HUD AND VETERANS AFFAIRS SUPPORTIVE HOUSING

ENDING VETERANS' HOMELESSNESS

Tens of thousands of America's veterans are living on the streets despite their invaluable service and sacrifice for their country. The Department of Housing and Urban Development and the Department of Veterans Affairs are working together to get these veterans a roof over their heads, targeting those most vulnerable: the veterans at risk for chronic homelessness, often due to substance abuse problems, debilitating injuries or mental health issues. It can be challenging to work with veterans, who tend to fall through the cracks and get missed by other programs designed to assist them with their housing needs. It can be difficult to find these vulnerable veterans, much less serve them. The fact that multiple stakeholders are involved further complicates how to coordinate and track program participants.

The goal of the collaboration between HUD and Veterans Affairs Supportive Housing, known as HUD-VASH, is to reduce veterans' homelessness by 59,000 by June 2012 and end it by 2015. The profile of the nearly two-decades-old program was raised substantially in 2008 when it received $75 million from Congress. In fiscal year 2011, the administration made the program one of its High Priority Performance Goals, that is, a challenging, performance improvement goal that doesn't require additional resources or legislation and can be achieved within 18 to 24 months. The program's focus ramped up into a coordinated, multi-agency effort to end homelessness.

Veterans who meet the criteria determined by VA become eligible for housing vouchers, which are HUD-backed subsidies landlords receive to make up the difference between actual rents and the amounts veterans can pay. HUD manages the voucher program while VA provides case management and treatment services. The program relies heavily on local governments, nonprofit organizations and other federal agencies to help deliver services, such as local public housing authorities (PHAs), which serve as hubs for processing paperwork and for distributing HUD housing vouchers. Similarly, VA increasingly partners with local nonprofits to help identify eligible veterans and to serve their mental health needs.

A key program tenet is "housing first," the idea being that permanent housing is a starting point for treating veterans' substance abuse and mental health issues, rather than a goal following successful treatment. "The biggest barrier for most of human services is housing," says Estelle Richman, chief operating officer and acting deputy secretary of HUD. "If you can get your folks into stable housing, most of your other problems begin to go down." Caseworkers also can find and check in more regularly with veterans in stable housing and it allows VA to wrap other needed services around these veterans more effectively. They also can check more easily that veterans are managing their challenges and making progress.

In the course of analyzing program effectiveness, HUD changed from measuring the number of housing units funded to the number of veterans who are placed in housing, a more accurate measure of who is actually being helped. Now, program success is measured by whether housing vouchers are used rather than just that they were issued. The success rate is based on the percentage of vouchers converted into new leases for homeless veterans.

Bottlenecks can occur all along the way from distributing vouchers to getting leases signed, so good use of analytics is important for smoothing the process. From the data, agency staff and leaders can learn about problem spots and where they need to focus attention. HUD provides VA with weekly reports on voucher use, along with a detailed report on the status and recent activity of every veteran in the program. VA uses a dashboard to track the number of veterans who are screened and approved for voucher eligibility, referred to public housing authorities and get housing vouchers. The housing and veterans agencies and their other stakeholders are each responsible for key parts of the program, but their efforts must be well coordinated if they are to be truly effective.

Leadership sets the course and prompts culture change

HUD employees are no strangers to data but they hadn't always done much with the information. "They don't use data," said Richman, "they collect data," which is not unusual in a bureaucratic organization, she added. Because of its heavy emphasis on regulations, HUD has traditionally focused on monitoring compliance with public housing regulations, according to Richman. Most of the reporting is done internally, as required by GPRA and has been treated as a compliance exercise, rather than a way to learn and improve.

Recently, however, Secretary Shaun Donovan implemented a performance management program called HUDStat, modeled in part on the popular CitiStat programs for improving police performance that started in New York and was adopted by other big cities. The secretary runs and sets the tone for quarterly meetings, which examine performance measures for several key programs with high-priority performance goals and bring together political and career leaders with program staff to review and discuss performance issues. VA leadership and staff also attend when the focus is on the veterans' supportive housing program. Program staff comes armed with performance data, ready to discuss challenges they're facing. Together, everyone seeks solutions that can be applied locally and nationwide.

For HUD, knowing they have a "stack" of vouchers isn't enough. Program staff must address fine-grain details to identify bottlenecks and figure out how to target resources. Staff troubleshoots issues by looking at manageable chunks of data from the complex program, such as referrals, eligibility and leasing. For example, if the number of ineligible referrals is high, it becomes a possible flag for staff training. Or if there are delays in qualified veterans completing their leases, it may be an indicator staff has to do more outreach with landlords in certain geographical areas.

HUD political leaders encourage staff to ask, "What do the numbers tell us," said Richman. It's important to show people, "how it really matters in their day-to-day work, not just once a quarter when you have a big meeting." Leaders have found that reviewing data openly is an important step toward cultural change and helps staff overcome fears that using analytics is some kind of punitive measure. Few examples of successful data use are as powerful as HUD's recent shift in how it views its vacancy rate, a measure of empty housing units under its public housing program. "A 7 percent vacancy rate used to stir little passion," said Peter Grace, HUD's performance improvement officer, that is, until an analysis showed that each 1 percent of the vacancy rate equaled thousands of homeless veterans, making it clearer to staff what was at stake.

VA has a longer tradition than HUD in using data to inform program decisions and manage performance. Three processes encourage staff to manage using data, according to Zlowe: monthly program performance reviews with the deputy secretary; performance reviews of senior executives by a performance review board; and quarterly operational management reviews on each of VA's 16 major initiatives, which include elimination of veterans' homelessness, along with getting rid of the backlog in a benefits

MYTH: DIRECT CONTROL OVER THE ACTIVITIES MEASURED IS ESSENTIAL

Some agencies have argued that they can't develop effective performance measures because delivery partners are "in control" of the results, since they provide the service or administer the program. However, the programs we reviewed demonstrated they were able to overcome barriers, build collaborative relationships and work with delivery partners toward common goals. "It became apparent that if we were going to make further progress, we would need to enlist more partners," said Thomas Hamilton, Director, Survey & Certification Group, CMS. "How do we partner and reach agreement on a common goal? We need metrics to do that."

MYTH: FOCUS ON PERFORMANCE MEASURES FIRST AND EVERYTHING ELSE WILL FOLLOW

Success is as much about building relationships to create an analytics culture as it is about collecting data. When both the people requesting information and providing it believe that they share a common purpose, such as ensuring air safety or eliminating veterans' homelessness, it builds buy-in and fosters an analytics culture.

management system and establishing a virtual lifetime electronic record, among other things. The VA deputy secretary leads the monthly performance reviews, at which the heads of staff offices refer to briefing binders with up-to-date numbers for each of the 400-plus metrics the department tracks, largely in computer spreadsheets, as at HUD. Staff in attendance must be prepared to explain the reasons for poor results on any of these metrics.

Operational management reviews are more in-depth quarterly program reviews during which project leads and key staff from the 16 major initiatives meet separately with the deputy secretary to focus on their programs. The performance reviews add one more layer of program accountability. The board reviews the annual performance of senior VA managers and examines the key program results under their responsibility and factors those results into decisions affecting compensation and bonuses.

Together, these reinforcing mechanisms promote accountability for results, and the department's senior leadership sets the tone and supports and directly oversees the process. Zlowe emphasized that the power of VA's analytics approach is not in the numbers but in the discussions that are sparked. "The core is having leadership engage in an appreciative conversation guided by hard data," he said. The deputy secretary's willingness to make data-based program decisions makes VA's reviews more meaningful, according to Zlowe.

VA has an advantage in tackling the challenges of the HUD-VASH program. It already maintains an extensive electronic medical record for individual veterans, which details veterans' medical history and interactions with the VA throughout their lives. These detailed records allow VA to put critical information into the hands of caseworkers working with veterans so key needs are not missed and veterans receive appropriate services. The medical records data can be analyzed by cohort, location and other elements, allowing VA program staff to spot patterns across groups of veterans—both problems and successes—which can provide additional insight into the effectiveness of program efforts.

For the HUD-VASH program, VA enters its data into HUD's Homeless Management Information System, making the data more consistent and complete. Working together, these agencies have created information that allows program managers to understand how veterans access services and identify where there are service overlaps between the agencies and providers. "Our goal is to get our systems to talk and to share identified data," said Vincent Kane, director of VA's National Center for Homelessness Among Veterans. "We are systematically working that." Personal connections have deepened between staff at the two agencies as they have worked together on analyzing the data, tracking progress and solving problems. "When you expand your networks and find people whom you realize are able to help you do your job better, you don't let those kinds of connections lapse," said Susan Angell, executive director of VA's Veterans Homelessness Initiative.

The linchpin for working well together

Shared values and goals are a linchpin for establishing and sustaining good working relationships across agencies and with delivery partners, as well as the foundation for building trust. Staffs at HUD and VA believe their counterparts care deeply about the needs of vulnerable veterans and are working to provide the necessary support for them, according to Zlowe. Program officials from both agencies noted many examples of collaboration that led to solutions on joint concerns. Headquarters and field staff from both agencies meet weekly with their counterparts to share information, discuss difficult cases, identify training needs and, in general, keep the lines of communication open. The collaboration has not been without challenges. Early on, both agencies realized they each had their own method of estimating the total number of homeless veterans and that the estimates didn't line up, causing confusion for program staff and outside stakeholders. But they were able to agree eventually on a single, consistent methodology.

Perhaps no example of HUD and VA interactions captures the value of the cross-agency relationship better than a recent HUDStat meeting looking at performance challenges in Los Angeles. The city and surrounding counties currently have more than 2,000 housing vouchers. More than 25 percent of the nation's homeless veterans' population lives in California, and Los Angeles County has the state's largest number of these veterans. But data reported in program dashboards suggested that veterans in Los Angeles were getting lost in the system and that the seven separate public housing authorities

were taking longer than normal to approve paperwork, delaying getting housing vouchers issued.

The HUDStat team, with HUD-VASH staff from both agencies, converged on the city for a site visit. They met with local staff from the housing authorities, interviewed community leaders and talked with medical providers and mental health professionals to try to understand the troubling numbers. HUD shared findings, metrics and stories, and discussed the challenges they identified. A key finding was that the housing authorities often did repetitive or unnecessary work, and their procedures kept veterans stuck in the system far longer than necessary. Another finding was that Los Angeles County and Los Angeles City had different methods for handling HUD-VASH vouchers. The problems identified largely cropped up in the county.

Local housing authorities' leaders expressed willingness to work with HUD-VASH staff to improve processes. In short, the metrics helped pinpoint problems and their locations. Follow-up discussions revolved around explantions for what the data revealed. And, local VA field staff helped streamline the process by working with the two largest public housing authorities in the city to standardize paperwork and develop a uniform application process. Although still a work in progress, the meetings and analysis have set the housing process on a better path toward fixing the situation.

Combining forces for additional insights

Several challenges arose for the two agencies as they combined their data analysis efforts. Introducing an analytics process didn't ensure that staff was able to use it, or use it well. The skill set to understand and employ analytics was lacking in some cases and staff required additional support and training. HUD currently is addressing this challenge. Secretary Donovan recently has allowed the regional offices administering the program to add a full-time equivalent staff member dedicated to analytics. Training is underway at headquarters and in the field in the form of analytics boot camps.

Second, analytics didn't always tell the same story to all staff in the organization due to people at different levels having different perspectives on housing activities. Field staff operating closer to beneficiaries often found benefits from getting anecdotal information validated by data, but headquarters staff discovered it was more important to view aggregated data that illustrated trends and patterns. In addition, staff responsible for different parts of a program may have viewed measures in opposite ways. For example, the housing measure used to track the time that elapses between when a voucher becomes available and when a veteran uses it to secure a housing lease meant different things to staff at the two agencies.

From HUD's perspective, faster is typically better. Unused vouchers represent needy veterans who are not being helped. By contrast, VA caseworkers can equate the longer times to the increasing difficulty of the cases they are seeing, once the "low-hanging fruit" has been picked. Since the HUD-VASH program is designed to identify and support the most vulnerable population of chronic homeless veterans, it's almost expected that the more successful the program becomes, the more difficult it may be to identify and address the remaining cases. So it is necessary to revisit the measures and what they mean as the program continues to evolve. Using analytics has enabled the conversations to take place to make these changes.

MYTH: THE PERFORMANCE MEASURES ARE THE OUTCOMES

A meaningful set of measures is a means to an end, not the end itself. Measures are indicators that show progress against a goal and, ideally, generate meaningful discussions on a program's progress—what's working, what isn't and why. With these measures, leaders can more accurately assess program performance. "It's not about the metrics," said David Zlowe, PIO at VA, "it's about the performing of the mission."

FAA'S SAFETY MANAGEMENT SYSTEM

IMPROVING AIR SAFETY

On any single day, thousands of airplanes are in flight. The mission of the Federal Aviation Administration (FAA) since its inception has been to ensure safety in the skies, and it has earned a global reputation for setting the aviation safety standard. As it continues to carry out its mission—keeping accident rates as low as possible—the agency is implementing an agency-wide safety management approach, known as the Safety Management System (SMS).

It started in FAA's Air Traffic Organization (ATO), an organization whose job it is to move air traffic safely and efficiently, and is now being implemented agency-wide. It has extended to the Airports Organization, which is responsible for airport safety, design, construction and operations, and Aviation Safety, responsible for pilot and aircraft certification. The stakeholders for all three business lines are commercial and private aviation pilots and companies and organizations that provide aviation products and services.

Monitoring incidents and accidents that didn't happen

The Safety Management System addresses issues ranging from policy and processes to organizational structure, but its main objective is to assure safety and manage risk. Leaders rely on data to measure the effectiveness of its risk-mitigation efforts. Complex algorithms on nationwide safety trends help point out safety hazards and drive policy and help leaders make decisions on whether changes are needed and what they are. "Data, analytic processes and people are key in the decision-making," said Don Arendt, manager of the FAA Flight Standards SMS Program Office.

The safety system merges the ability to look forward and backward on safety issues, rather than only measure past problems or incidents or blindly look to avoid hazards in the future. The approach focuses on moving from reactively responding to events, such as incidents and accidents, to proactively seeking to identify hazardous conditions by analyzing agency and system processes to identify and avoid future problems. These proactive measures also apply to FAA's stakeholders such as airports and airlines, some of which are employing their own voluntary safety management pilot programs.

A key component of the Safety Management System is an employee-reporting system that allows the FAA to get information directly from the people closest to the hazard, and the agency provides employees incentives and protects their identity to encourage them to report safety issues.

For example, if ATO employees identify a hazard, the information is analyzed and then made available across the agency through its computer systems and databases and can be shared with an airline or airport. "This program has helped us create a culture of reporting in the FAA," said J. Randolph Babbitt, FAA Adminis-

MYTH: LEADERSHIP IN ANALYTICS HAS TO START AT THE TOP

Some agencies have built an analytics culture that started within a component in a department rather than from the top down. While leadership unquestionably is a necessary ingredient, an analytics program doesn't have to start at the top. FAA's Safety Management System, for example, started in a component organization before it expanded agency wide. It is now promoted by top agency leadership.

trator.[4] Fostering a culture of transparency helps the agency uncover safety issues before they become problems. "We encourage air traffic controllers to report operational errors in exchange for the agency addressing the errors in a non-punitive manner," Babbitt said. "This is ultimately a very positive change that will enhance safety by enabling us to identify risks and spot trends." The information-sharing and reporting activities encourage a new attitude toward safety and help the agency learn whether corrective actions to address safety issues are working.

FAA is early in its agency-wide adoption of the safety system and its use of analytics is evolving. Currently the agency collects a wide variety of data and is developing analytics capability to measure the effectiveness of its actions, but it has a way to go. For example, the agency can address a controller mistake detected by radar, but may not know the root cause of the mistake. With analytics, FAA is now beginning to understand what contributes to all levels of hazards. "We are gathering more information than we ever had previously, and that data will allow for more informed decisions moving forward to enhance the safety of our system," Babbitt said.

Brainstorming safety solutions

Every FAA office collects large amounts of data and most of the data is integrated into one of the large databases that is used by the lines of business and links to other databases across the agency. But analyzing and sharing data presents some complexities. The agency has to standardize data definitions and find ways to work with protected data, such as confidential airline data, that is not allowed to be linked with government information for identifying trends. FAA is developing workarounds that allow analysts to go through hundreds of available reports and develop safety benchmarks and flight profiles that include characteristics such as speed and altitude. It also is automating data collection to reduce delays in providing reports and in data-entry errors that stem from multiple entries of the same information. Air traffic control, airport offices and other FAA lines of business are working together to develop common policies.

When a safety issue arises, the standard protocol is to bring in stakeholders, such as data and safety experts, to brainstorm and develop mitigation plans. FAA has not yet reached the goal it set for using analytics but is making strides. "This is one of the few programs that can now take all the information," said Tony Fazio, Director, Office of Accident Investigation and Prevention, "then merge it and mine it to tell a story." The analysis is helping the agency move "from solving the accidents to predicting the accidents."

For example, the ATO might study air traffic controller errors if there is a trend in allowing aircraft to fly closer to each other than is acceptable. The organization uses risk analysis to determine the causes of this "loss of separation of aircraft." It ranks the top categories of losses and uses the analysis to identify training or other actions needed to prevent the problem in the future. It then monitors the data to see if steps it has employed have had an effect on reversing the trend. The ATO has proven its ability to identify certain actions contributing to safety concerns and fix them.

Spotlighting the benefits of data and empowering staff

As FAA began its analytics journey, it was important that leaders were willing to collaborate with industry to collect and report data. FAA has been working with stakeholders as they develop their safety management systems. Efforts are underway to make the agency's Safety Management System adaptable to existing data systems and programs, as the combined information and analyses will be a key factor in meeting safety goals. In addition, it was important to get all staff on board to share reports of hazards and problems. One way to do that was to begin to change the culture from penalty-based to encouragement for sharing information. That brought support from the FAA's labor unions, an essential ingredient to building trust, and created employee ownership in safety management.

To insure confidentiality, a third party gathers the safety data reported by employees, removing personal identification information before sharing the results at the FAA. When action is required on a safety issue, a committee comprised of management, union and oversight organization representatives reviews the facts and recommends corrective actions if necessary. "People help drive improvements. Being able to justify safety improvements and determine

4 Testimony before the U.S. Senate Committee on Commerce, Science, and Transportation, Subcommittee on Aviation Operations, Safety and Security on Air Traffic Control and Safety Oversight, May 24, 2011.

what to work on first becomes very difficult to prioritize," said Joseph Teixeira, vice president for safety at the Air Traffic Organization. "Our solution is to bring as many stakeholders together as possible to get a sense of where they are going and what's important."

The Seattle-Tacoma Airport, for example, experienced a spike in ramp accidents involving employees loading planes and driving around terminals. Airport officials informed by data trends recognized the workforce was comprised of people with varying responsibilities and skills who were performing diverse jobs. They determined it would be best to hold separate, focused training sessions for each group of employees and drew a line to demarcate tarmac from runway personnel, recognizing the distinct training requirements for each area. The number of accidents plummeted, according to program officials.

But data tools are not effective unless everyone, including those who don't know how to crunch data, understand the benefits of the information they have and how to use it. FAA is developing tools to make it easier for people to assemble data from different sources and to read and manipulate it so they can analyze it without the assistance of program staff versed in statistical theory. The FAA presents a clear example of how an agency is changing its culture to use data to inform its decisions and meet its core mission. The effort has become a major agency-wide strategic initiative.

In fact, the adoption of the Safety Management System is the one of the biggest transformations in FAA history and is setting the standard for regulations around the globe. The agency has teamed up with key stakeholders, including the airline industry, manufacturers and regulators, and received support from FAA leadership, its nine labor unions and Congress. That support, as well as recognition by leadership that the agency needs to rely on good data, have been critical elements for success. "From the COO down, [the Safety Management System] is very data-driven," said Jeffrey Loague, director of Data Management and Analysis at ATO. "It drives capital investment, decision-making and system investment."

CONCLUSION

In reviewing agencies on their road from data to insight to decision-making, it becomes clear that developing an analytics mindset is a not a short-term effort, but an evolutionary process that takes time and commitment to performance management. Managers must weave into their organizations' fabric a dedication to continuous improvement. In addition, performance management takes leadership and champions who must work to gain and sustain buy-in and ownership at all levels. Leaders must know what they want to achieve with analytics and communicate it openly. Clarity of goals and outcomes allows agency staffs to understand how they contribute to program results.

An analytics program does not have to start at the top. Performance improvement efforts can start small and grow via a pilot-program approach, but it's important that efforts are tailored to fit the agency's culture and that of its constituents, as well as meet mission requirements. An analytics program also should establish accountability for expected results.

No one enjoys criticism or failures, but agencies should regard those as opportunities to improve and invigorate performance management and analytics programs. Leaders should view their agencies as learning organizations and focus on building trust. Creating a supportive and safe environment that allows staff to identify problems and address them will reduce apprehension and build commitment. Finally, agencies need to collaborate across their own organizations and beyond to draw in partners, including states, localities, providers, advocacy groups and others. There will undoubtedly be bumps along the road to a successful analytics program. The most important next move is to get started, with the understanding that many of the details and subsequent steps can be learned along the way.

APPENDIX A
METHODOLOGY

In collaboration with IBM's Business Analytics & Optimization practice and The IBM Center for The Business of Government, the Partnership for Public Service set out to identify promising practices from agencies using analytics to drive decision-making and improve performance. Our objective was to share the agencies' stories of how they evolved their analytics programs to make them more useful and meaningful to leaders and how they integrated these programs into key decision-making processes to promote greater mission effectiveness.

Between May and September 2011, we reviewed seven programs in eight diverse agencies that had experience using analytic strategies and techniques and whose stories were compelling and translatable to other agencies. We selected programs in four agencies to examine in greater depth and profile in case studies—the Department of Housing and Urban Development and Department of Veterans Affairs jointly administered Veterans Affairs Supportive Housing (HUD-VASH) program; the Federal Aviation Administration's Safety Management System (FAA SMS); and the Department of Health and Human Services' Centers for Medicare & Medicaid Services (CMS) Medicare Program (nursing homes and transplant programs). The other four agencies also had compelling stories around specific leading practices and we have highlighted their efforts. They include: Coast Guard's Business Intelligence Tool (CGBI); National Highway Traffic Safety Administration's "Click It or Ticket" campaign (NHTSA); the Navy's Naval Aviation Enterprise (NAE); and the Social Security Administration's use of mission analytics in customer service (SSA). We performed a literature search, reviewed agency documents and interviewed more than 45 officials, including chief operating officers and performance improvement officers, as well as program and analytics staff, to understand how agencies use analytics to inform decisions, assess progress and drive meaningful changes in programs to achieve mission goals. We were particularly interested in how these agencies create a culture comfortable with using analytics, how they addressed challenges or barriers to using analytics, and how they built their analytic capacity in terms of staff, technology and tools. We discussed our results with OMB and congressional staff leading or supporting government-wide performance improvement efforts.

APPENDIX B
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