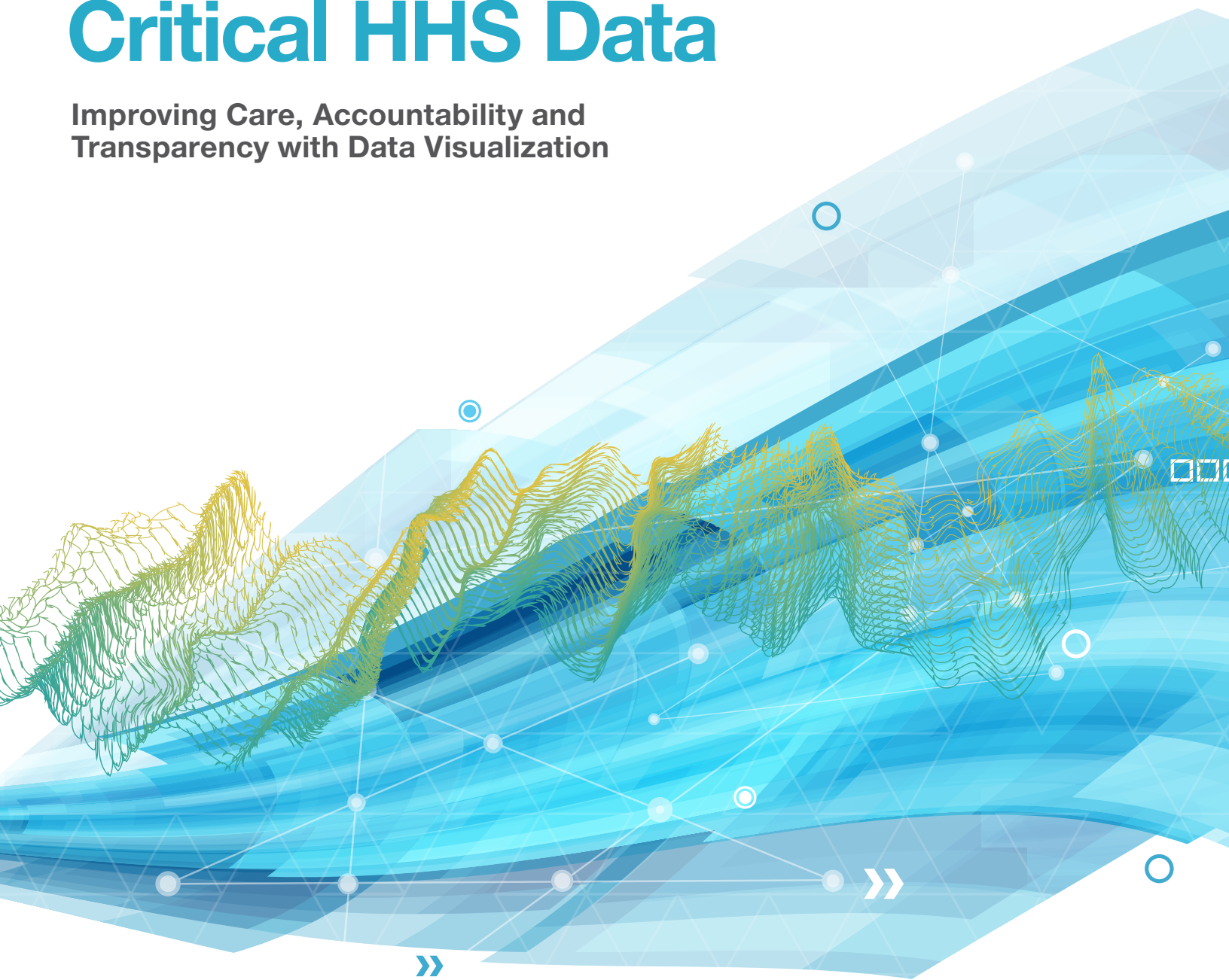


A WHITE PAPER FROM

GOVERNING
INSTITUTE

How to Effectively Analyze Critical HHS Data

Improving Care, Accountability and Transparency with Data Visualization



That “Aha” Moment

In 1854, Britain’s Soho neighborhood suffered a severe outbreak of cholera. People were dying, but no one was sure how they were contracting it. Conventional wisdom said the dreaded illness was airborne, but British physician John Snow rejected this notion and began plotting cholera cases on a map. This visualization allowed Snow to clearly see that all cholera cases in the neighborhood originated at a local water pump. Snow removed the pump handle and cases of cholera dropped. John Snow’s map gave him the “aha” moment he needed to link cholera to water. Without the map, he had the data — but no way to see what it meant.

More than 160 years later, the ability to access, manage and analyze critical data about our health care and human service needs is still problematic. Knowledge workers who could recognize insights that lead to new solutions often find it hard to extract the most useful information from the massive amounts of data collected by most HHS organizations.

The ability to visualize this data and achieve these “aha” moments is increasingly important for an agency to manage spending effectively, increase operational efficiency and



John Snow used visualization via a map to determine the source of a cholera outbreak.

improve service delivery. What agencies need are better ways to connect analytical capabilities with the analysts and program managers who can draw knowledge from the data, then share it for policy decisions and operational actions.

Higher HHS Spending Raises the Bar for Data

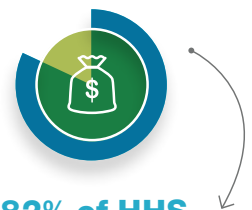
The Affordable Care Act and expanded Medicaid programs are bringing new funding, clients and providers into HHS agencies. This growth will continue, with state and local health spending expected to reach nearly \$700 billion by 2018.¹

The increases in spending and program size put pressure on HHS agencies to keep up with capabilities for faster, better decision-making and service delivery. Collecting and using data more effectively is one way to improve an agency’s work and performance. In a Governing Institute survey in June 2015, 82 percent of HHS leaders said analytics are critical to lowering health care costs and improving outcomes, and 77 percent said analytics are critical for identifying fraud.²

However, already overburdened IT departments may not be able to deliver these analytics in a timely or cost-effective manner using traditional data tools. And with HHS already accounting for 25 percent of all IT spending by state and local governments, simply hiring more IT staff to write more reports may not be feasible.³ In addition, traditional reporting tools that only “slice and dice” the data in a slightly different way won’t deliver the higher level of relevant, thought-provoking and actionable information that agencies need.

Making Data Easier to See and Understand

In a Governing Institute survey conducted in late 2015, 83 percent of survey respondents said the ability to visualize data in new ways would add value to their organization.⁴ To expand their analytics tools, HHS agencies are looking favorably on data visualization software.



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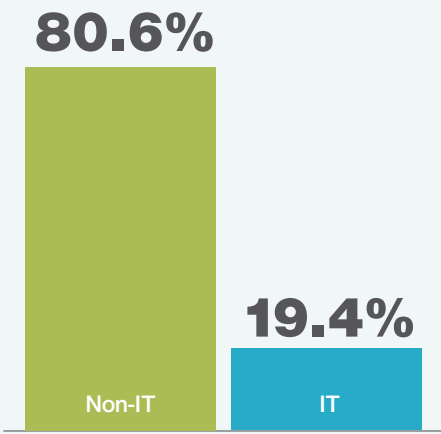
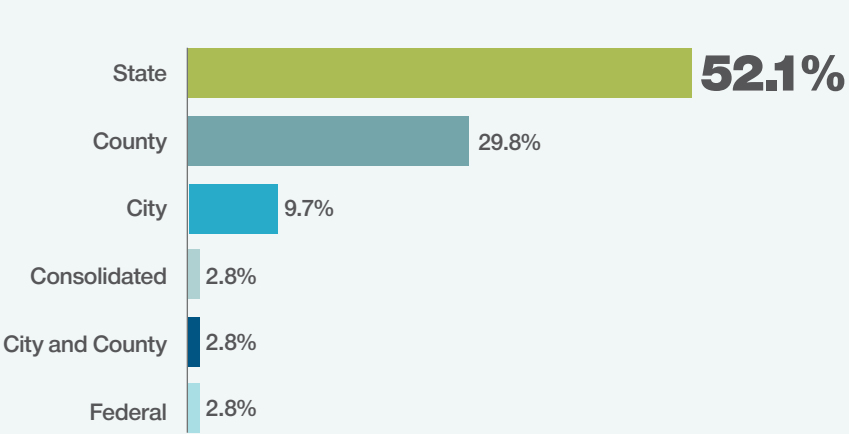
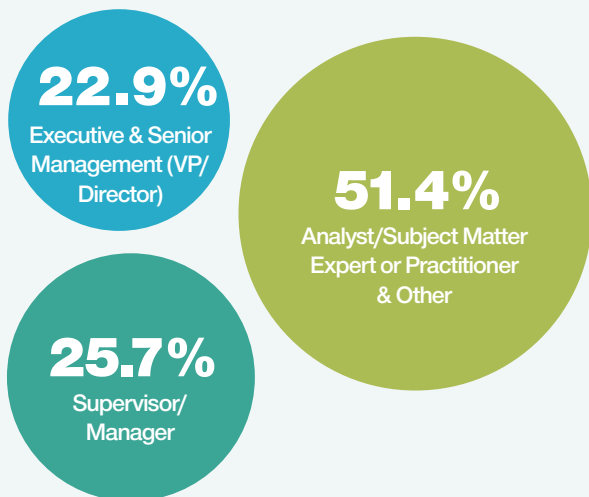
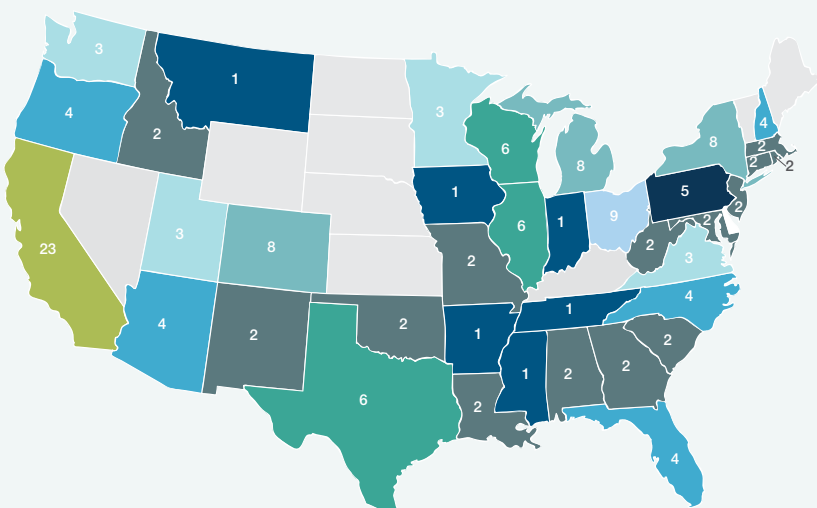
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HHS Leaders Weigh in on Their Use of Data Analytics

In late 2015, the Governing Institute surveyed 144 health and human services professionals about their use of data and analytics in reporting metrics, analyzing program success, gaining insights and more.

A Look at Our Survey Respondents

Survey respondents hailed from these states:



Why More Data Doesn't Automatically Mean Better Decisions

Health and human services agencies are already awash in data and reports; the challenge is making that information more accessible and useful. When the Governing Institute asked HHS leaders specifically about their agency's data analysis capabilities, they cited three constraints.

1 Current presentation tools have limitations.

The tools most commonly used for data presentation are spreadsheets (74%), static graphical reports (67%) and text-based documentation (66%). These formats are valuable for compliance with reporting mandates and basic monitoring of service activity and performance. However, they may not make it easy to spot outliers, trends or other data views that yield fresh insights. Without a deep understanding of the data, fixed reports and spreadsheets are also prone to errors in data selection, calculation and interpretation.

74% of HHS agencies surveyed use spreadsheets for data presentation.

How Do You Deliver Analytics Currently?

	Currently Producing	Plan to Produce	No Plan to Produce	Do Not Know	No Response
Text-based Documentation	66%	4.2%	5.6%	15.3%	9%
Spreadsheets	74.3%	.7%	4.2%	11.8%	9%
Static Graphical Reports	66.7%	8.3%	3.5%	12.5%	9%
Static Dashboards	38.9%	16.7%	13.2%	22.2%	9%
Interactive Data Visualizations	23.6%	19.4%	23.6%	24.3%	9%
Other Advanced Analytics	13.9%	21.5%	14.6%	41%	9%

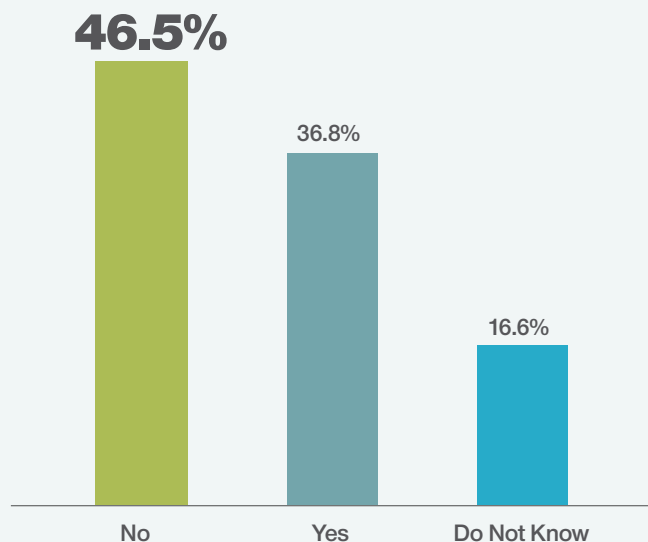
2 Data isn't easily accessible to employees who are most involved with the actual service delivery programs.

Analysts often don't have flexible tools to retrieve, analyze and present data from agency systems on their own. Dashboards can be difficult and time consuming to develop with standard database tools.

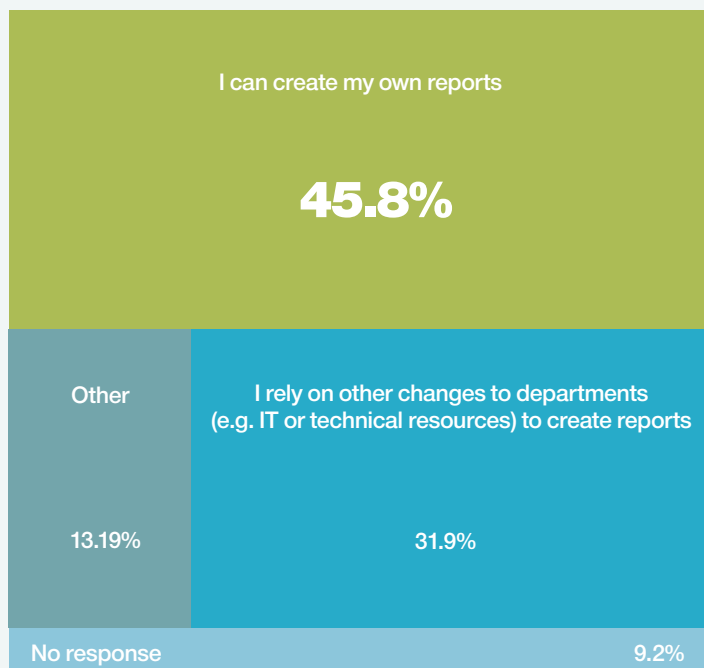
Thirty-two percent of survey respondents rely on IT or another department to create reports. This dependence typically means:

- Lengthy waits for inflexible reports that may not provide all the answers needed.
- Inefficient use of IT resources that could be better allocated to higher-value projects such as cybersecurity and new technology deployments.
- A report development process that is difficult to manage for consistency, efficiency, accuracy and scalability.
- Lack of flexibility to change reports and dashboards easily as the agency addresses new goals and mandates.

Do current reporting practices meet your needs?



Who Creates Your Reports?



3 Data is often stored in isolated systems according to statutory or program mandates.

Connecting data systems within an agency and with systems in related agencies can produce significant results. For example, in Missouri a data-sharing project among the departments of Health and Senior Services, Mental Health and Social Services is helping reduce Medicaid emergency room visits for a cost savings of \$8 million per year.

However, only 40 percent of agencies surveyed by the Governing Institute have a platform in place that can seamlessly access multiple data sources across groups or other organizational boundaries. The ability to access integrated data from multiple systems and sources is increasingly important for the complex work and decisions in HHS agencies.

Visualization is a way to take data that would be hard to understand in text or table form and present it in an image that helps users readily see its patterns and outliers. Although spreadsheets and standard database tools offer some capabilities for presenting data in visual form, they can be limited and hard to use. Visualization software offers more choices for presenting data in a form that's clear and easy to understand. The tool's user interface is designed to help non-IT staff access authorized data on their own and create reports and visuals as needed.

For example, a standard data report might indicate that a reasonable number of health care providers are serving Medicaid patients within a county. But plotting those provider locations on a map makes it possible to see if all areas of the county are receiving adequate service.

By offering flexible and creative tools for data analysis, visualization software helps agency staff explore questions that may be difficult or impossible to answer with traditional statistics and reporting tools. Examples of these questions include:

“What about ...?”

With a visualization tool, it's easier to answer ad hoc, real-time questions that aren't covered by existing reports. This capability is especially valuable for special requests from agency leaders, funding sources and elected officials, as well as to address issues raised by clients, providers, the media or citizens.

“Do we know where ...?”

The ability to see information on a map instead of a text table or list can be more effective for answering questions around service delivery and impact.

“What are the numbers behind ...?”

Drill-down capabilities in interactive charts and dashboards allow analysts and managers to view the source data and calculations that underlie a metric.

“Can we combine this data with ...?”

Visualization software can draw data from multiple sources to help analysts make comparisons, detect patterns and trends, identify timelines and distributions, and determine correlations and possible causality.

Benefits of Data Visualization for HHS Agencies

A data visualization solution can help an agency meet several core goals.

Achieve cost savings. Better data analytics help agencies reduce fraud, detect waste and analyze costs against outcomes.

Visualizations can be made by staff with a deep understanding of the data to target opportunities for cost reductions and recovery of improper payments.

Improve services. New ways of looking at standard information help optimize resources and identify the most effective service practices. Clear and compelling visuals help caseworkers and program staff grasp the impact of their work on client and program outcomes.

Create dashboards of key metrics. Agency leaders can view dashboards for clear, up-to-date information about performance and progress in attaining program goals, utilizing grants and meeting community needs. Real-time decisions can be based on complete and current evidence, not on assumptions or estimates.

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Improve operations. Visualization tools simplify information sharing across programs, departments and agencies. When all stakeholders see the same data, it's easier to solve problems and facilitate communications to work more efficiently and collaboratively.

Increase transparency. Many governments are adopting open data initiatives to improve transparency with constituents. An open portal allows public access to selected data from a single agency or as a collaborative effort with other government organizations. A portal allows citizens, health care providers, volunteer civic programmers, journalists and community organizations to access published data sets or defined graphics. This accessible information helps stakeholders develop local strategies for service improvements.

Current Tools Still Have Value

Agencies can continue to obtain value from current reports and analytics capabilities. For example, analysts at the Florida Agency for Healthcare Administration (AHCA) use statistics software, reporting systems and numerous spreadsheets to track and report data. “Instead of seeking a single solution, it's important to continue using all of these tools because they have different capabilities,” says Bryan Cook,

Picture This

The below examples show how HHS agencies are generating valuable knowledge by applying visualization tools to their data.

Measuring Patient Service Quality

The San Francisco Department of Public Health publishes data dashboards that show metrics about the quality of patient care. Available to the public on the San Francisco Health Network website, the dashboards indicate how well providers are meeting patient demand in key measures of service delivery.

Analyzing Hospital Profitability Levels

A commission appointed by Florida Gov. Rick Scott used data on state Medicaid expenditures in its assessment of utilization of these funds by hospitals in the state.

Mapping Asthma Rates

A cooperative project of the California Health and Human Services Agency (CHHS) and the California Healthcare Foundation developed an interactive map of emergency room visits for children with asthma. Using CHHS data published through an open data portal, local providers and communities can see data by county and zip code. The CHHS portal also offers access to non-confidential data sets and defined charts on a variety of health factors.

Identifying Poverty Levels by Neighborhood

The San Francisco Indicator project uses a geographic information system to map census data for identifying poverty levels by neighborhood. This map is one of many publicly available visualizations and data sets that cover eight dimensions of community well-being, including housing and health systems. It helps government staff with long-term planning and provides useful information to community stakeholders for communication and advocacy work. The project is managed by the Department of Public Health and the City and County of San Francisco.





Visualization Types

A broad choice of visual charts and graphs help users view data in a way that leads to more “aha” moments.



Continued from page 6

business intelligence analyst for the agency. “It’s also important to define good use cases for a visualization tool to make sure it is being used appropriately.”⁵

Finding Hidden Nuggets in a Mountain of Data

An emphasis on business intelligence is helping Florida AHCA devise strategies and make decisions that are informed by better access to the agency’s data. “We sit on a mountain of data and we need to dig deep into it to make sure we meet our mission and make the best use of taxpayer dollars,” says Cook.

The agency created a Business Intelligence Competency Center (BICC), which focuses on helping agency staff make better use of data analytics and visualization tools. The BICC team trains analysts on using the agency’s visualization software and supports users with training and a monthly user group meeting. Additionally, the team works with the IT department and program units to improve data access. “Our job is to help users understand what data is available and find the best tools to work with it so that it doesn’t become siloed within a unit,” says Cook.

By using visualization technology, the agency has realized significant time savings for developing reports and is able to improve data quality. “Instead of a lengthy, multi-step process to work with IT on defining a report, an analyst can now create a visualization in an afternoon,” says Cook. “And with visualization, we can quickly detect inaccuracies in data that may have been invisible for years just because of the millions of data records we retain.”

Getting the Right Data to Ask the Right Questions

The San Francisco Department of Public Health is working to improve operational activities and financial monitoring to meet new state and federal health care service mandates. As part of these efforts, the agency’s business intelligence unit is using visualization tools to create new reports and dashboards with standardized performance indicators.

“Although we had a set of metrics to start with, they were scattered across spreadsheets and reports and didn’t always have common definitions,” says Jennifer Tsuda, a business intelligence analyst with the department. “We are now creating a process to standardize and govern how key metrics are defined and developed.” This process will create a single source of truth

for a metric so its meaning will be consistent across different reports and charts.

Identifying the intent of the metric is one of the most important aspects of the definition. “The best measure of whether a metric is successful is if people are using it to ask more and better questions about the information it presents,” says Tsuda. “It’s not just making sure that the right number appears in a visualization or report. It also means asking if the metric will indicate when the agency needs to dig deeper or take action on an issue.”⁵

Bringing Data Visualization into Your Agency

HHS agencies can take several steps to promote successful adoption of data visualization tools.

Establish accountability. Direction and accountability for appropriate use of visualization tools should start at the agency’s executive level and continue throughout the organization.

By adding a visualization solution to its set of data analysis tools, an HHS agency gains a new way to present statistics and metrics. More importantly, an agency gains a means to help all stakeholders see information that can be readily applied to improving the lives of everyone in the community.

Set realistic expectations. It’s important for users to understand the types and depth of information they can obtain from any analytics tool. Although visualization makes it easier for users to access data, necessary restrictions mean they may not get everything they want. Additionally, consider offering data literacy training to staff who will be performing more data analysis as part of their jobs.

Update data policies and procedures. Verify that the use of any new analytics tool will comply with requirements around privacy protection and data use and release. For example, some HIPAA policies restrict the use of even depersonalized data. Additionally, configure user roles and security measures to control data access.

Determine implementation parameters. Before selecting a visualization solution, identify necessary compatibility with current systems and agency needs. Consider whether an

in-house or cloud deployment is the best choice and whether users will need tool access on mobile devices.

Clean up the data. A useful and accurate visualization requires high-quality, complete data with a standard definition. San Francisco’s Tsuda notes that even a seemingly simple data point such as “number of primary care visits” must consider numerous factors to be representative and useful for decision-making. It is also important to create procedures for verifying data validity and consistently managing data across systems.

Seeing More Data for Better Decisions and Action

Health and human services agencies are in a time of multifaceted expansion in mission, service demand and delivery, funding, and expectations for transparency and accountability. This expansion increases the need for timely and agile information, decision-making and responsiveness to elected officials, funders and citizens.

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Endnotes

1. eRepublic.com, “Study Shows Shifting Trends in the State & Local Health & Human Services Market,” <http://www.erepublic.com/blog/study-shows-shifting-trends-in-HHS-market.html>
2. In June 2015, the Governing Institute and the Center for Digital Government conducted a nationwide survey of 285 state and local government leaders about the status of health and human services in their jurisdictions, the challenges they face and how they are working to overcome them.
3. Ibid.
4. In December 2015, the Governing Institute surveyed 144 HHS leaders regarding their challenges around performance reporting and their views on data analytics and visualization. All statistics in the paper reflect their answers unless otherwise noted.
5. Governing Institute interview with Bryan Cook, conducted on Feb. 4, 2016
6. Governing Institute interview with Jennifer Tsuda, conducted on March 4, 2016



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