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Health system analytics
The missing key to unlock value-based care

Findings from the Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Executive summary

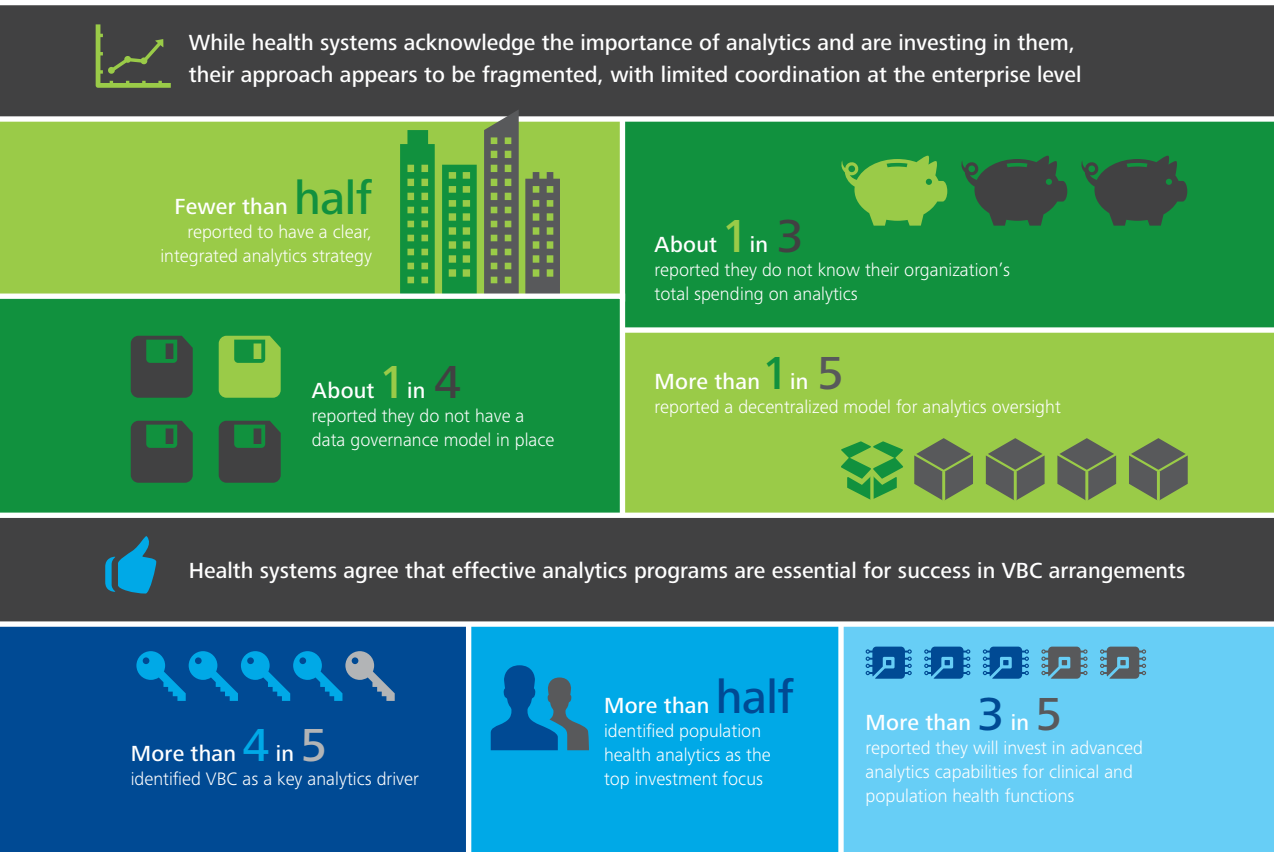
Talk of analytics and "big data" is everywhere in the health care industry these days. Many stakeholders agree that analytics provide insights that can enable organizations to improve quality and reduce costs, a combination that is essential to implementing effective value-based care (VBC) programs. As health systems continue to face shrinking margins, tightening budgets, and evolving payment models, analytics are being touted as the missing key to unlock new sources of value. But, do adoption and investment match the hype? Results from the Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey indicate mixed results. The survey shows that health system spending on analytics aligns with reported success in analytics and respondents agree that analytics investment is essential for VBC. However, many organizations still lack a clear strategy, an effective data governance model, and effective budgeting models.

Conducted in 2015, the survey targeted Chief Information Officers (CIOs), Chief Medical Informatics Officers (CMIOs) and senior technology leaders in health systems, academic medical centers (AMCs), and large (revenue greater than $500 million) individual hospitals.[i] The 50 survey respondents represent nearly 15 percent of health systems of this size. The survey's intent was to understand these institutions' analytics investments and priorities.

Health systems analytics adoption and investment is projected to grow, though perhaps not as dramatically or rapidly as some in the industry predict. Only five organizations reported that they expect their analytics spending to grow significantly in the next three years. Also, respondents at several organizations indicated they lack clarity on their current analytics spending, so it is difficult to determine their future spending. Explanations for this pattern may lie in challenges such as culture, operating models, and fragmented oversight. More than half of the respondents mentioned these factors as top barriers for analytics adoption. Other exacerbating factors may include lack of access to funding; numerous vendor product offerings, which may be confusing; and inconsistent industry definitions of analytics.

[i] From this point forward, the paper will use the term "health systems" to reference health systems, academic medical centers, and large hospitals.

Survey says ...



As the shift from fee-for-service (FFS) payment models to VBC continues — including Medicare's plans for increased value-based payments by 2018 — organizations will need to blend financial, operational, clinical, and other data to achieve their goals of improving quality, providing access, controlling cost, and managing provider networks. A fragmented analytics strategy will not support effective integration of such data. While some leading organizations recognize the importance of committing to a coordinated business model and sufficient analytics investment, others are still figuring out their path.

Analytics is quickly becoming viewed as a competitive differentiator for VBC and can add value to a variety of other organizational goals, including consumer experience, growth initiatives, and cost reduction. Organizations with a centralized strategy and governance structure will likely be best positioned to move from the promise of analytics to superior performance.

Analytics refers to the systematic use of technologies, methods, and data to derive insights and to enable fact-based decision-making for planning, management, operations, measurement, and learning.

The impetus for analytics

Health care analytics is growing in importance, fueled by industry stakeholders' thirst for information; the need to manage large, diverse data sets; increased competition; growing regulatory complexity; and innovations ranging from precision medicine to VBC to population health management. It is understandable that many look at health care analytics as "the next big thing" — health systems are undergoing a major transformation in how they are paid and how they are expected to deliver care, and analytics can assist with the transition. Also, as more data becomes available from sources like electronic health records (EHRs), claims, medical devices, and patients, analytics can help detect hidden patterns in information, delivering actionable insights and enabling self-learning systems to sense, predict, infer, and conceive alternatives that might not otherwise be obvious. In the future, such insights are likely to play a major role in helping health systems improve costs and quality, identify at-risk populations, connect with consumers, and better understand performance.

Analysts' estimates vary, but widely publicized numbers for today's global health care analytics market range between $4 billion and $5 billion, with the US accounting for about half.[1] At a projected eight-to-eleven percent annual growth rate through 2020, analysts expect analytics to be one of the highest areas of spending growth for US health systems.[2] Venture funding for health care analytics reached $393 million in 2014, the biggest of all digital health funding categories.[3] But do health systems' investments in analytics match analysts' expectations? Based upon survey responses, investments are getting there but not as soon as anticipated. To better understand how analytics is moving from buzzword to actual investment, the Deloitte Center for Health Solutions conducted a survey of health systems to understand current capabilities, investment priorities, and analytics approach.

Survey methodology

The Deloitte Center for Health Solutions conducted an online survey in early 2015 to understand health systems' analytics investments and priorities. The survey targeted health systems with revenue of $500 million or above. 50 respondents (about 15 percent of institutions of this size) completed the survey, and their findings are analyzed for this report. (See Appendix for further methodology details.)

Key survey findings

The survey found that, despite the proliferation of analytics offerings and many discussions about the need for analytics to support VBC payment and delivery models, health systems are still defining their enterprise-level analytics strategies and investments.

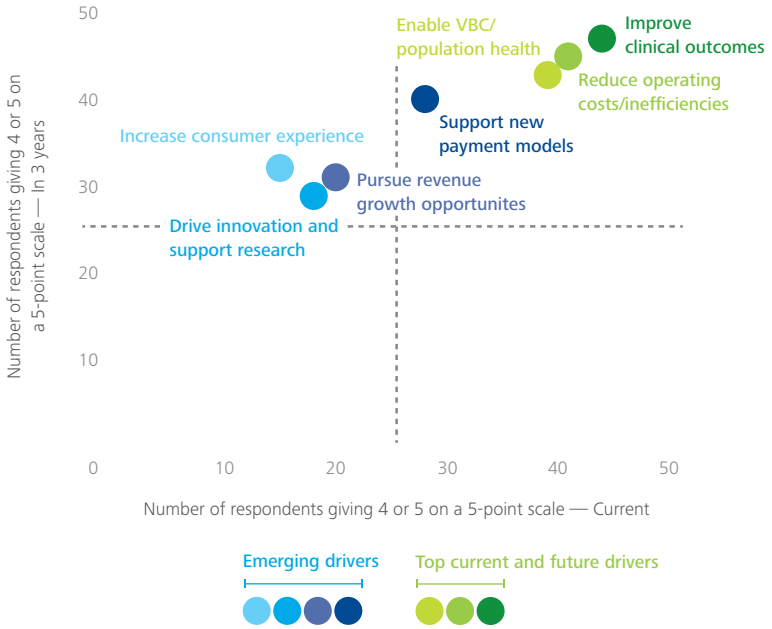
Investment drivers: VBC is a major driver and investment focus for analytics.

According to more than 75 percent of survey respondents, clinical outcomes, population health, and cost efficiencies are top drivers of analytics investments today (Figure 1). Respondents expect this trend to continue over the next three years. Respondents expect future drivers of analytics investment to include supporting new payment models, pursuing revenue growth, driving innovation, and improving the consumer experience.

Analytics investment priorities reflect the same VBC-focus, with clinical and population health analytics as top investment areas (Figure 2). While financial management analytics have been a priority for health systems in the past, respondents indicate that population health and clinical analytics will become higher priorities in the next year.

Figure 1. Improving clinical outcomes and enabling VBC are reported top current and future analytics drivers

Drivers influencing analytics investments



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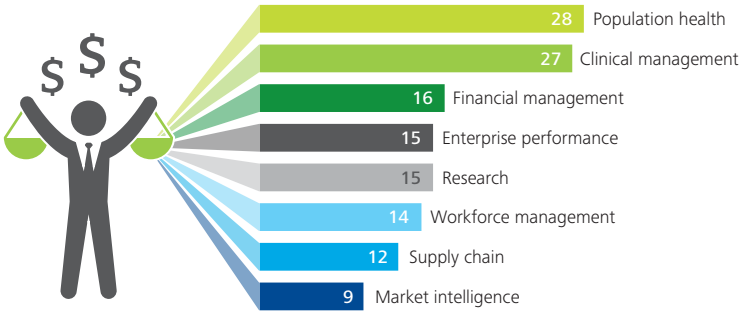
Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Figure 2. Investing in population health and clinical analytics are reported priorities in the next year

Analytics investment priorities within the next year, by number of respondents



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Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Capabilities: Analytics capabilities are currently limited, but achieving advanced analytics for VBC is a priority.

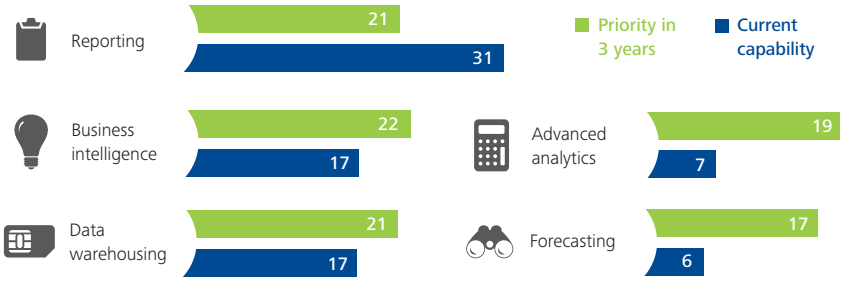
Organizations were asked how sophisticated their current analytics capabilities are and what their future priorities are for building capabilities. Note that analytics capabilities range from business intelligence (e.g., reporting, dashboards, ad hoc queries) and relational data warehousing functions to forecasting and advanced analytics features (e.g., data mining, self-service analytics, statistical analysis, predictive modeling, natural language processing, machine learning, big data, and cognitive computing).

Many surveyed organizations already have reporting capabilities in multiple business functions. Top capabilities that organizations plan to add in the coming three years and that they are targeting for additional investments include business intelligence and advanced analytics (Figure 3). AMCs, and separately health systems with revenues above $2 billion, reported that they are more likely to have advanced analytics capabilities today, although AMCs, based on survey results, appear weaker in forecasting capabilities and market intelligence areas (data not shown).

VBC support appears to be a priority, based upon the top business functions (clinical, population health, and financial management) to which respondents plan to add advanced analytics capabilities in the next three years (Figure 4).

Figure 3. Reporting capabilities are most common; adding business intelligence and advanced analytics capabilities are reported as priorities in coming years

Medians of current and targeted capabilities across functional areas*



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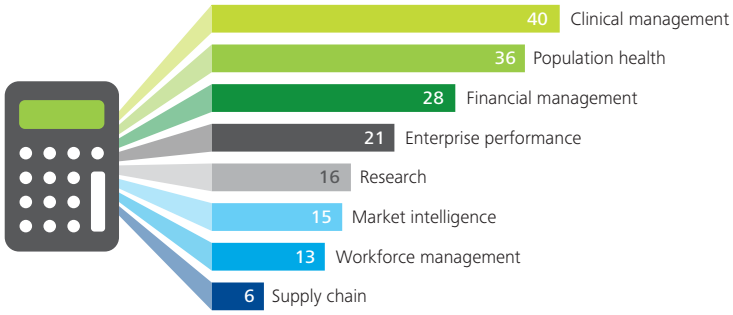
* Functional areas include clinical, population health, financial management, enterprise performance, workforce, supply chain, market intelligence, and research

Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Figure 4. Advanced analytics capabilities for clinical and population health functions are priorities in the next three years

Functional areas where organizations reported targeting adoption of advanced analytics capabilities in the next three years, by number of respondents



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Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

University of Michigan Health System's (UMHS) success with analytics for clinical and population health management[4]

"Analytics changes the way data and technology are viewed. It breaks down traditional barriers that have limited IT and addresses the movement and use of data." — Dr. Andrew Rosenberg, Chief Medical Information Officer, UMHS

Michigan-based health system UMHS includes three hospitals, 40 outpatient locations, extensive home care services, research, and education centers. UMHS was one of only two ACOs in the Medicare ACO Pioneer program which improved both outcomes and margins. One of the cited contributors to this success was UMHS's consistent use of analytics to drive clinical decision-making and population health management.

UMHS created comprehensive registries for population health and used them to generate predictive analytics that focused predominantly on chronic diseases. Through enterprise-level data governance and information management, UMHS aims to leverage analytic insights to improve the effectiveness of existing programs and enable new innovations such as public health genomics, pathology informatics, cancer research, and perioperative analytics — all of which may help to improve quality processes and, ultimately, outcomes for additional populations. These initiatives will support innovations in care delivery, research, medical education, and administrative functions.

Spending: It is difficult for many organizations to determine total analytics spending; some indications of spending growth exist.

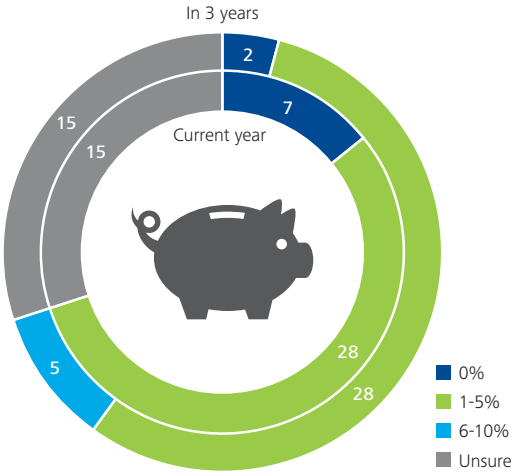
Fifteen of 50 surveyed organizations report they do not track their overall spending on analytics, indicating potentially fragmented coordination of analytics capabilities (Figure 5). Seven organizations state that their analytics budget is currently zero percent of the enterprise operating budget; this could be due, in part, to a broad range of analytics definitions. There are some indications of spending growth: five surveyed organizations with analytics budgets of one-to-five percent of the enterprise operating budget expect their analytics budgets to increase to six-to-ten percent in the next three years.

AMCs, and separately health systems with over $2 billion in revenue, are more likely to have a larger analytics budget compared to non-AMCs and health systems having revenue below $2 billion (data not shown).

Importantly, spending in analytics appears to align with reported success in analytics. Those organizations which spent one-to-five percent of their enterprise budget on analytics report success in certain functions (Figure 6); this may be partially attributed to analytics program maturity and spending levels. For example, in the past few years, numerous organizations have made investments in Electronic Medical Records (EMR), Revenue Cycle Management (RCM), and Enterprise Resource Planning (ERP) solutions, which are often accompanied by investments in business intelligence and basic analytics functionalities. These organizations report success in financial management, clinical management, and enterprise performance management compared to other functional areas. A limited number of respondents also report improvements in population health management, but this is more likely due to early VBC adoption.

Figure 5. Respondents at several organizations indicated their spending on analytics is unknown; few anticipate an increase

Current spending on analytics as a percentage of the enterprise operating budget and anticipated spending in three years



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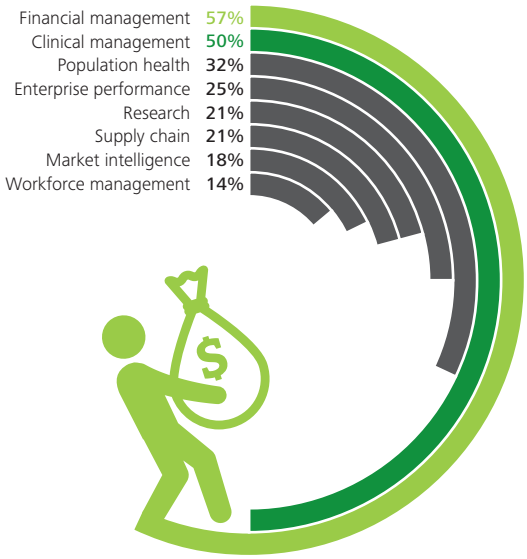
Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Figure 6. Respondents with more analytics spending report success for financial and clinical management

Percentage of respondents spending 1-5 percent of their operating budget on analytics and report success with analytics (4 or 5 rating)



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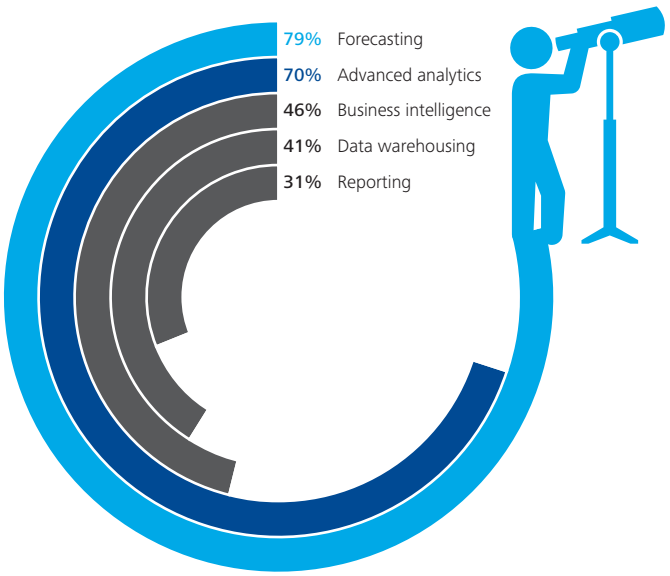
Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Success: Health systems with more mature analytics capabilities report greater success with analytics for their business functions.

Health systems using analytics for more mature applications (i.e., advance analytics and forecasting) report greater success with analytics for their business functions (Figure 7). Like a virtuous cycle, the more success organizations achieve, the more likely they are to invest in additional advanced analytics solutions and benefit further.

Figure 7. Organizations with advanced analytics and forecasting capabilities report success with analytics for their business functions

Median percentage of respondents for whom analytics adoption has been successful (4 or 5 rating) based on their current capabilities in the functional areas



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Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Data governance models: Analytics governance models are fragmented, inconsistent, and varied.

A strong governance model can help health systems focus priorities and efforts on driving value from analytics-enabled insights. While surveyed organizations report some elements of strong data governance strategies, many lack a centralized governance model (Figure 8). Only 20 organizations have a clear, integrated strategy for analytics deployment across various business functions, although organizations with revenues above $2 billion are more likely to report that they have an integrated strategy (data not shown).

Twenty-one of 50 respondents report that they do not have a formal enterprise-level data governance process and only six have a Chief Analytics Officer (data not shown). However, three out of four organizations have a department dedicated to delivering analytics to the enterprise (data not shown).

Nearly half of respondent organizations lack centralized oversight of analytics tasks and functions (Figure 9). Centralized or not, these functions may be owned by either IT or business. Management of the analytics architecture tends to be driven by the IT organization while other functional analytics applications, such as staffing utilization, budgeting, and planning, are more likely to be directed by the functional business unit.

Figure 8. Fewer than half of health systems have an enterprise strategy and vision for analytics

Responses to the statement: *"Our health care organization has a clear, integrated strategy and vision for analytics deployment across hospital functions."*

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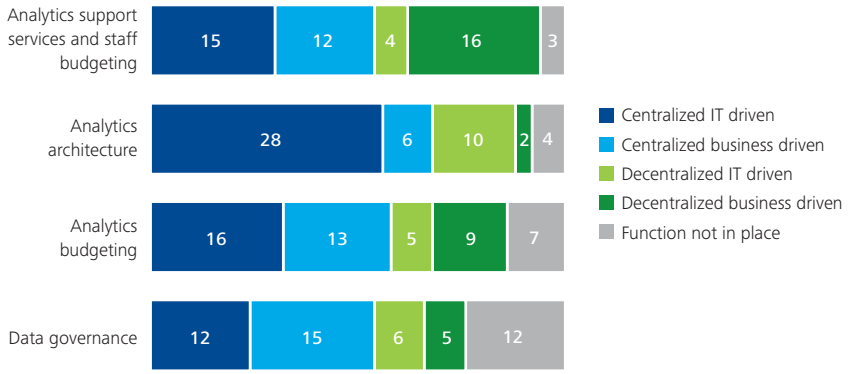
Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Figure 9. Few health systems have centralized oversight for analytics tasks: IT drives architecture and business functions drive budgeting and governance

Respondent preferences on analytics-related tasks and functions



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Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey

Analytics governance at Beth Israel Deaconess Medical Center (BIDMC)[5]

"At Beth Israel Deaconess, we have engaged governance." — Dr. John Halamka, Chief Information Officer, Beth Israel Deaconess Medical Center

BIDMC is an AMC for the Harvard Medical School, in Boston, MA. BIDC recognized that, as the health care environment continues to change, it should build and invest in information technology (IT) for the future.

In regards to analytics, Dr. Halamka noted that, "An EHR is fine for a single doctor to do analytics, but it is not enough for population health or care management."

Through its centralized analytics governance model, BIDMC provides layers of decision support and analytics for its numerous physicians. The health system's goal is to create a continuous care management system for population health and analytics that will help BIDMC understand variations in cost and care and maximize quality, safety, and efficiency.

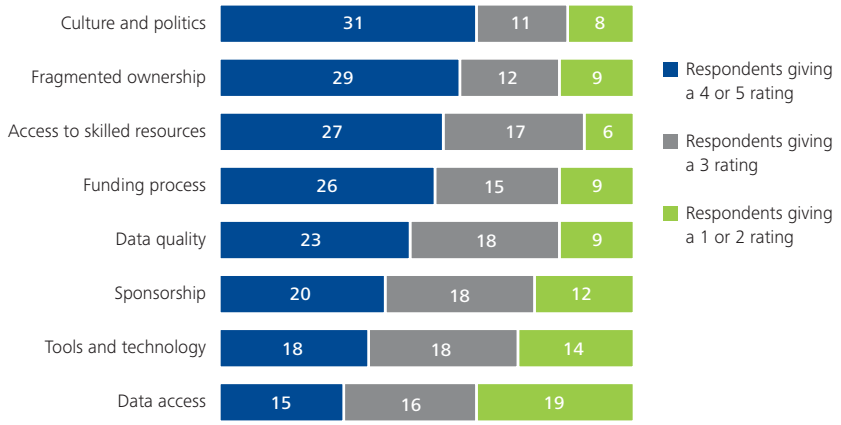
BIDMC has regular board committee meetings where it discusses analytics strategy. In addition, the analytics strategy is communicated to every manager and every supervisor during leadership meetings. While governance is a challenge, it helps the institution's stakeholders understand why and where it plans to invest.

Barriers to adoption: Culture and fragmented ownership are the top challenges to analytics adoption.

Culture, fragmented ownership, and access to skilled resources are the top challenges health systems face with analytics adoption (Figure 10). Access to data is the least-influential barrier, although data quality is a barrier reported by almost half of the survey respondents. For smaller organizations (those with revenues of $500 million to $1 billion), access to skilled resources and access to funding for enterprise analytics continue to be significant barriers (data not shown).

Figure 10. Culture and politics, fragmented ownership, and access to skilled resources are the biggest barriers to analytics adoption and investment

Respondents ranking barriers to analytics investments and implementation efforts on a 1 to 5 scale (1 = no influence; 5 = high influence)



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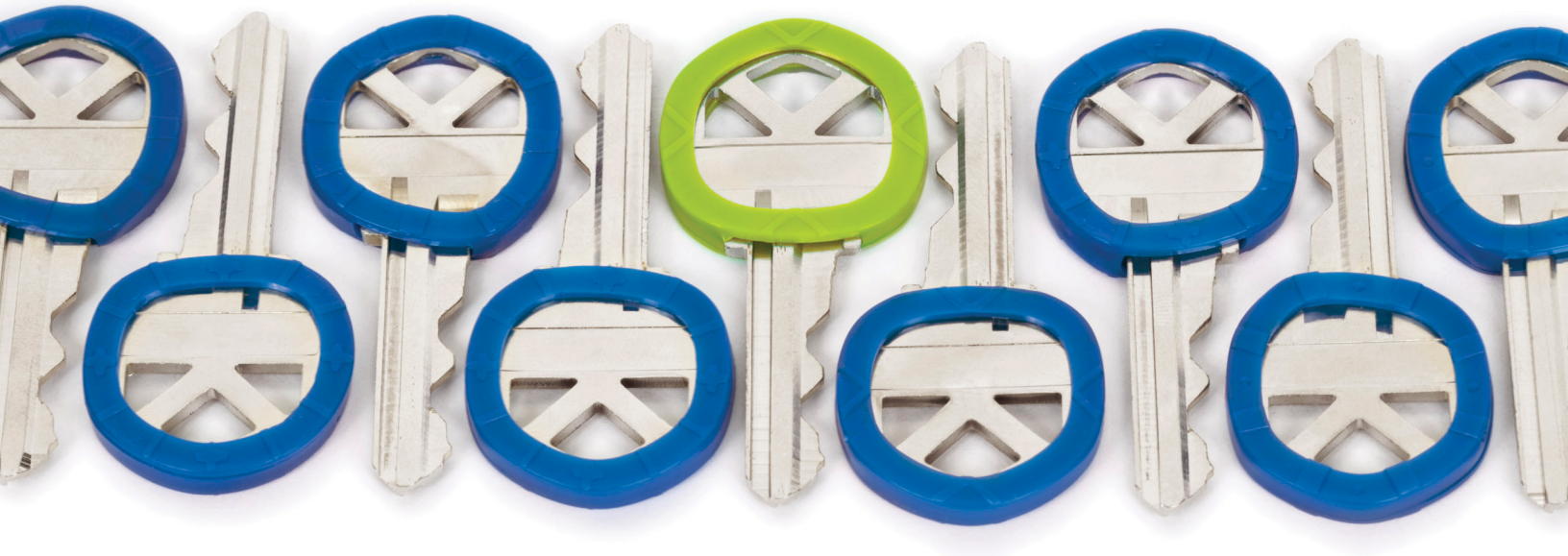
Source: Deloitte Center for Health Solutions 2015 US Hospital and Health System Analytics Survey



Implications

Surveyed organizations agree that analytics-driven insights will play a significant role in the implementation of their VBC programs. Analytics can add value to organizational initiatives by delivering actionable insights for improving the consumer experience, identifying inefficiencies to reduce costs, or enabling new value-creation opportunities.

Based on the survey results, it appears that there is a relationship between the maturity of health system analytics programs and success with analytics. Conversely, organizations that do not have an enterprise-level analytics strategy, structured data governance model, and coordinated analytics investments are less likely to achieve the same level of success with analytics. Many health systems have yet to take advantage of the capabilities that analytics can bring to meet their enterprise objectives.

The need for mature analytics capabilities is expected to grow as the health care industry moves to increased digitization, and health systems participate in VBC arrangements that require insights to support more effective decision-making. Organizations will need more sophisticated tools and capabilities to be able to integrate, analyze, and leverage their data. Based on Deloitte's work with clients and these survey results, health systems should consider the following as a framework for analytics adoption:

- Engage and develop committed leaders across the enterprise who are committed to understanding and leveraging analytics to deliver superior results.
- Implement a structured data governance model and enterprise-wide analytics strategy.
- Manage analytics capabilities and investments to drive innovation and tangible value for functional business units and programs.
- Emphasize data and technology standards to promote interoperability and more efficient use of analytics resources.
- Recognize the cultural aspects of leveraging analytics to accelerate insight-driven results.

In the coming years, the vast majority of health systems will need to respond to industry issues such as VBC, consumerism, and increased regulation. Enterprise analytics, if proactively managed with a focus on results, can help organizations address these and other operational challenges.

Appendix

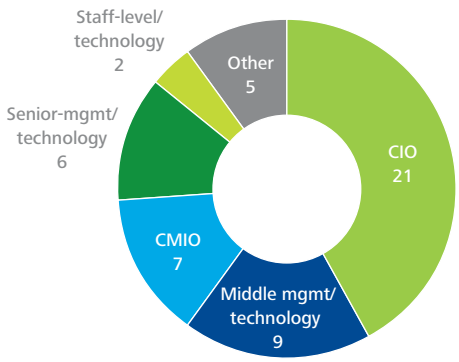
Survey methodology

Deloitte conducted an online survey of 50 health systems in early 2015. Respondents were from organizations with annual revenues of $500 million or more. Respondents included Chief Information Officers, Chief Medical Informatics Officers, and technology senior-management-level professionals (Figure 11).

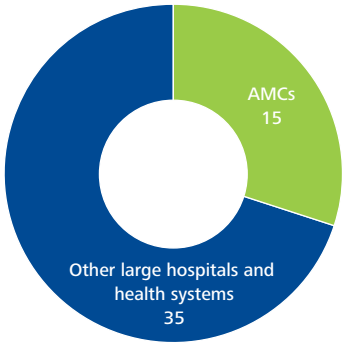
Figure 11. Breakout of survey respondents

The survey consisted of questions regarding governance models, investment drivers, investment focus, analytics capabilities, success in and barriers to adoption.

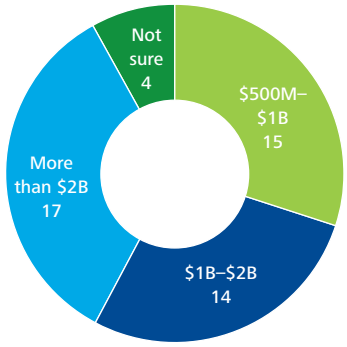
Respondents by respondent title



Respondents by organization type



Respondents by revenue size



Definitions

Reporting: Ad-hoc data reporting

Data warehousing: Data warehousing and data integration

Business intelligence: Static and interactive dashboards

Forecasting: Root cause, descriptive, correlation, and regression analysis

Advanced analytics: Predictive, optimizing, and real-time analytics

Clinical analytics: Clinical effectiveness, quality reporting, safety, research, patient readmissions, provider network management, medical cost management

Population health analytics: Wellness program effectiveness, immunization programs management, disease management

Financial management analytics: Revenue cycle management, reimbursement modeling, revenue recognition, cost reduction, forecasting

Enterprise performance management: KPIs, performance measures, service level agreements, alerts, and dashboards

Market intelligence analytics: Clinical program performance, competitive analysis, demand forecasting, advocacy

Workforce analytics: Talent management, workforce effectiveness, capacity planning, staffing and scheduling optimization

Supply chain analytics: Spending analysis, contracting effectiveness, vendor compliance management

Research analytics: Approval management, collaboration, secondary use of medical information

Endnotes

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Authors

Mitch Morris, MD
Vice Chairman and
Global Leader, Health Care
Principal
Deloitte Consulting LLP
mitchmorris@deloitte.com

Nitin Mittal
Principal
Deloitte Consulting LLP
nmittal@deloitte.com

Christine Chang
Research Manager
Deloitte Center for Health Solutions
Deloitte Services LP
chrchang@deloitte.com

Maulesh Shukla
Senior Analyst
Deloitte Center for Health Solutions
Deloitte Services LP
mshukla@deloitte.com

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Harry Greenspun, MD
Director
Deloitte Services LP
hgreenspun@deloitte.com

Sarah Thomas, MS
Research Director
Deloitte Services LP
sarthomas@deloitte.com

Deloitte Center for Health Solutions
555 12th St. NW
Washington, DC 20004
Phone: 202-220-2177
Fax: 202-220-2178
Email: healthsolutions@deloitte.com
Web: www.deloitte.com/centerforhealthsolutions

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