

A Healthy Dose of Data Analytics

Healthcare providers around the developed world are feeling the squeeze to do more with less. Deploying analytic capabilities across the organization supports timely, data-driven decision making for the continual improvement of both health and financial outcomes.



Healthcare systems across developed markets come in a variety of shapes and sizes, from the U.S. consumer-based fee-for-service model, to the British and Spanish government-led single-payer universal model, to mixed multi-payer systems in the Netherlands and Germany. But there is one thing they all have in common: the need to keep costs in check—a need that has become only greater in today's shaky economic climate.

According to a study published earlier this year by the Organisation for Economic Co-operation and Development (OECD), total health expenditure in its 34 member states remained flat in real terms in 2010, after growing at an average annual rate of 4.8 percent between 2000 and 2009. The same report shows that health spending as a share of gross domestic product dropped by 0.1 percentage points between 2009 and 2010, and preliminary figures indicate that a further decrease in real health expenditure across OECD countries is likely to have occurred in 2011.¹

Cost containment, then, is the order of the day for now, and not just for cash-strapped government payers. In fact, across the OECD, health spending by private insurers rose just 0.5 percent in real terms in 2010, after previous year-on-year increases of 5.4 and 8.1 percent. Even the growth of private households' out-of-pocket medical expenses has begun to taper off, despite the increase in patient copayments for treatment.

What isn't tapering off, though, is society's demand for top-flight, state-of-the-art healthcare. On the contrary, people continue to expect affordable access to the latest medical treatments, which they research on the Internet and discuss with other patients in advocacy groups and online forums. And healthcare complexity has increased exponentially, not only in terms of available treatment, diagnostic, and care management options, but also in terms of biomedical and clinical evidence. Moreover, aging populations, sedentary lifestyles, and poor dietary choices are giving rise to an ever-increasing number of chronically ill patients, often with multiple conditions, placing greater strains on healthcare systems than ever before.

But for providers, gone are the comfortable days of near-zero price elasticity when a well-negotiated fee schedule and a heavy patient volume were enough to guarantee a comfortable existence. Today, payers—both public and private—are more price-sensitive and require demonstrable value for their money. And many are following through on that demand by shifting to payments based on population, performance, and diagnosis-related groups (DRG).² In short, healthcare providers are feeling the squeeze to do more with less.

Data, Data, Everywhere

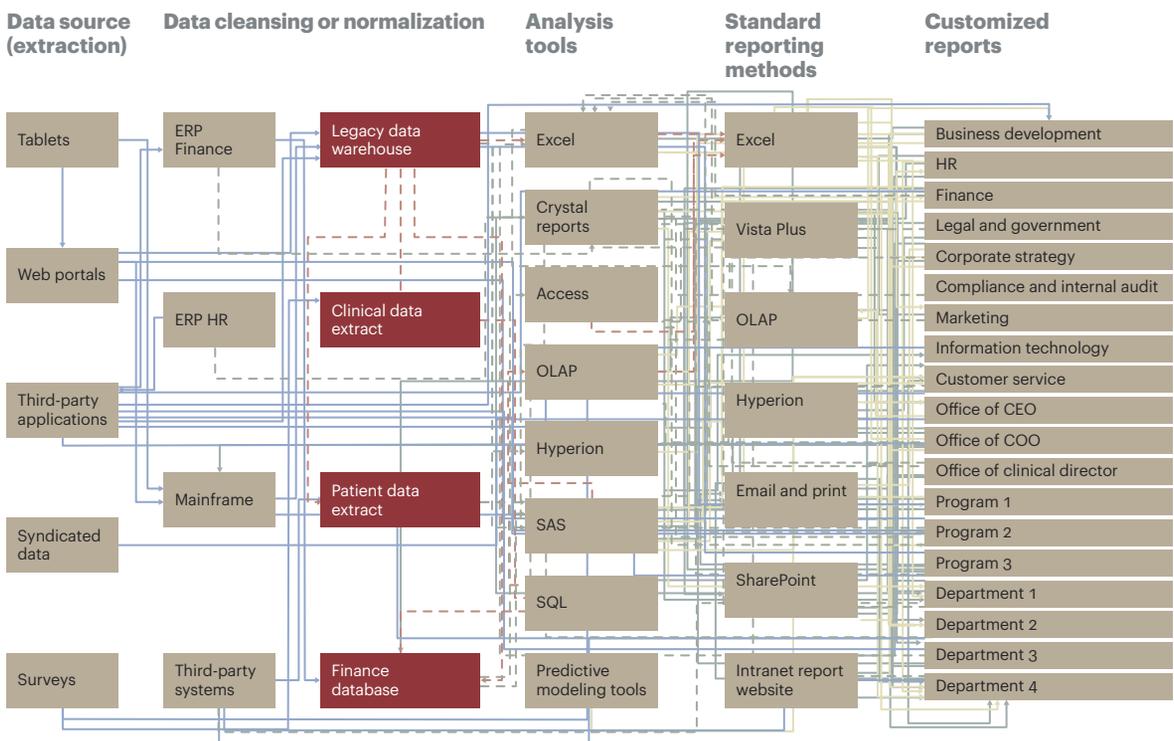
Of course, struggling to deliver good value at a reasonable cost is nothing new in most industries. Cutthroat competition is the stuff of legend in retail, where they have enacted wave after wave of cost cutting and revenue enhancement measures as they fight for an increasingly contested share of high-value consumers. For years now, many retailers have been exploiting a rich trove of personal, financial, operational, and transactional data, mining it continually for insights that will help better serve consumers and improve the bottom line. Decision-support models grounded in powerful data analytics are literally a life-or-death issue for players in many industries.

¹ David Morgan and Roberto Astolfi, "Health Spending Growth at Zero: Which Countries, Which Sectors are Most Affected," *OECD Health Working Papers* 60 (2013)

² Diagnosis-related groups (DRGs) cluster clinically similar conditions that require comparable amounts of healthcare resources. A DRG typically takes into account not only the main diagnosis, but also secondary diagnoses that indicate comorbidities and complications.

Yet healthcare providers, with some notable exceptions, have been latecomers to the data analytics game. It's not that data doesn't exist; it does, and in massive quantities. But fragmented provider information management systems, data privacy concerns, and, quite frankly, lack of market pressure have kept the issue low on the list of business priorities. When revenues appear to be available in limitless amounts, the investments needed to standardize, digitize, exchange, analyze, and act on information just don't seem to be very important. And make no mistake, the effort required even within a single healthcare provider—where enormous amounts of data are often divided among roles, functions, and systems—can be daunting (see figure 1).

Figure 1
The trouble with healthcare analytics is the jumble of roles, tools, functions, and systems



Notes: ERP is enterprise resource planning; SQL is structured query language; OLAP is online analytical processing.
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 Source: A.T. Kearney analysis

But providers now recognize that it is imperative to operate more efficiently and effectively, and deploying analytic capabilities across the organization can help make timely, data-driven decisions for continual improvement of both health and financial outcomes.

Perhaps the first question healthcare organizations face when developing an analytics-based decision support model is: Where do we start? The biggest challenge to executive decision makers is the prevalence of multiple sources of the “truth.” The scale and business complexity of most healthcare information systems can be overwhelming: Clinical, operational, and financial information is fragmented across roles, functions, and data sources, strategic performance measures are misaligned, and analysts’ skills need to be completely retooled. These complexities

undermine the quality of the analysis and insights generated for decision making. The resulting dilemma for healthcare organizations is to define standard data-collection protocols, resolve data inconsistencies across provider systems, and define scalable and robust data structures in a manner that enables actionable and timely analysis.

Increasingly, providers are turning to value-driven analytics to resolve this dilemma. Value-driven analytics is a systematic, business-led framework designed to build out the necessary skills, processes, and infrastructure for a successful business data analytics capability. The operating model of a value-driven analytics capability adheres to three practical guidelines:

- **Identify the value drivers of the business.** Focus on those analytic requirements that provide transparency and links to the cost, revenue, operational, and clinical drivers that key stakeholders can most influence through data-driven decision making.
- **Develop a complete, mutually reinforcing set of capabilities to extract insights.** Prioritize capabilities that will support analyses needed to make more informed, timely, and actionable decisions around the business drivers. Concentrate on developing capabilities in areas that will improve analytical proficiency and increase business analysts' capacity to generate insights on their own.
- **Quantify the value to the business.** Link specific macroanalyses or groups of analyses to concrete, sustainable, profit-and-loss impact to gain organizational buy-in and build accountability during the transformation.

Deploying analytic capabilities across the organization can help make timely, data-driven decisions for continual improvement of both health and financial outcomes.

Identify Value Drivers

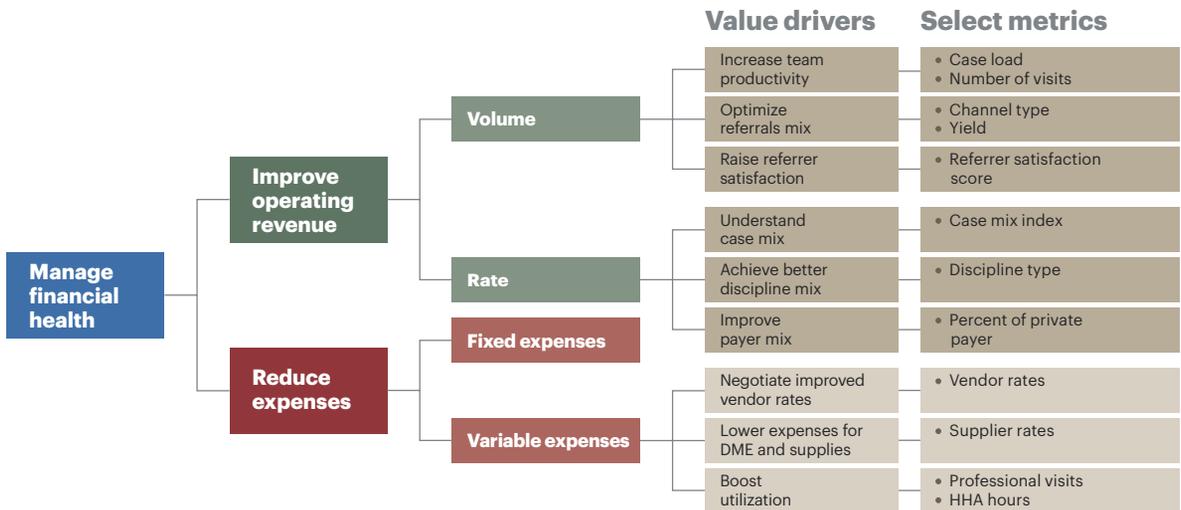
Value drivers can be thought of as the lifeblood of a healthcare provider's financial, operational, and clinical performance (see figure 2 on page 5). For example, active management of the payer mix is essential for improving operating revenue.

Value-driven analytics compiles an inventory of potential value drivers, and then prioritizes those most crucial to the business to determine the analytic requirements necessary for better decision making. Ideally, the approach involves stakeholders early in the requirements-gathering process, using workshops and interviews to select those drivers that require further focus. A deeper dive on each driver determines the critical analyses required, the metrics to track, the supporting data, the source systems for the data, and the execution capabilities—including professional competencies, supporting IT, and governance structure—needed to do so.

Figure 2

Value drivers and metrics for a healthcare provider

Example

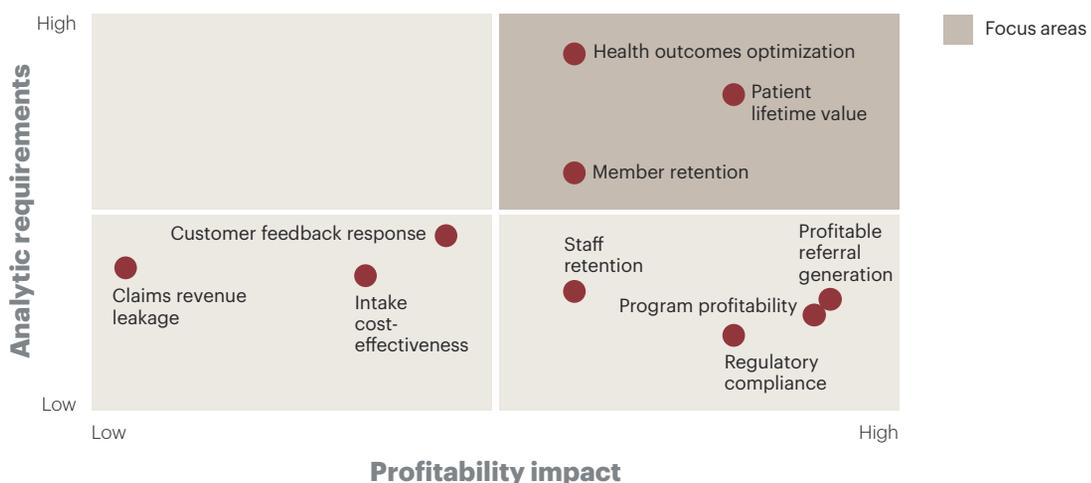


Notes: DME is durable medical equipment; HHA is home health aide.
Source: A.T. Kearney analysis

One client, a large home healthcare organization, found that patient lifetime value had a major impact on its profitability (see figure 3). Measuring this value, however, would require a significant analytic effort because revenue, cost-to-serve, and retention rate data resided in disparate data systems with varying degrees of data cleanliness and with no automated linkage to tie these data elements back to a unique patient identifier. The company also identified that one of the key factors driving patient lifetime value was the referral stage of the life cycle, including the source of referral, referral disposition, and yield rate.³ And for yield rate, it determined that

Figure 3

Focus areas have significant analytic requirements and a strong impact on profits



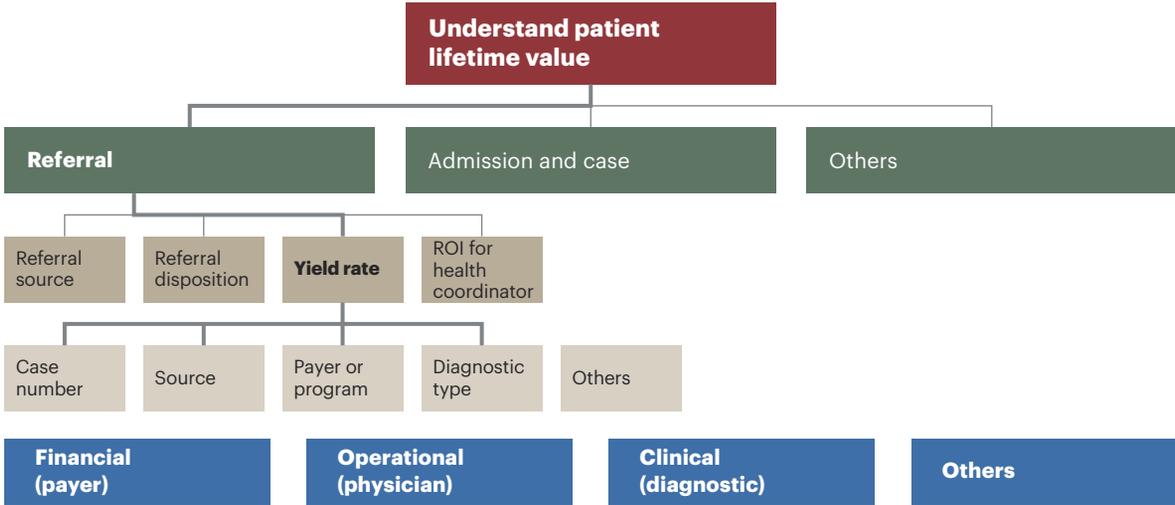
Source: A.T. Kearney analysis

³ Referral disposition is the type of response or action that the referring provider would like from the referred-to provider.

it would need to collect data on case numbers, referral sources, payers, and diagnostic codes, among other items (see figure 4). Many of these data elements were housed across several information silos that needed to be threaded together.

This drill-down approach has several benefits. It clearly defines which metrics should be monitored for remedial actions. It also forces the organization to harmonize multiple legacy definitions of similar metrics and develop a master data-management strategy around its disparate information systems, helping it move closer to conducting comparative analyses on an apples-to-apples basis. The CEO of a North American regional healthcare provider once remarked to us that, depending on the stakeholder, she receives as many as three distinct productivity metrics for her business; identifying the correct action is a challenge when the underlying metrics are so inconsistent.

Figure 4
Referrals are a main driver of patient lifetime value for this healthcare provider



Note: ROI is return on investment.
 Source: A.T. Kearney analysis

Furthermore, the approach can help break down functional data silos. As figure 4 shows, the supporting analyses and metrics for a particular driver often require multi-dimensional data from different domains—for example, covering financial (payer), operational (physician), and clinical (diagnosis type) areas.

Lastly, the approach ensures from the start that business expectations aren't lost in a sea of technical specifications.

Develop Complete, Mutually Reinforcing Capabilities

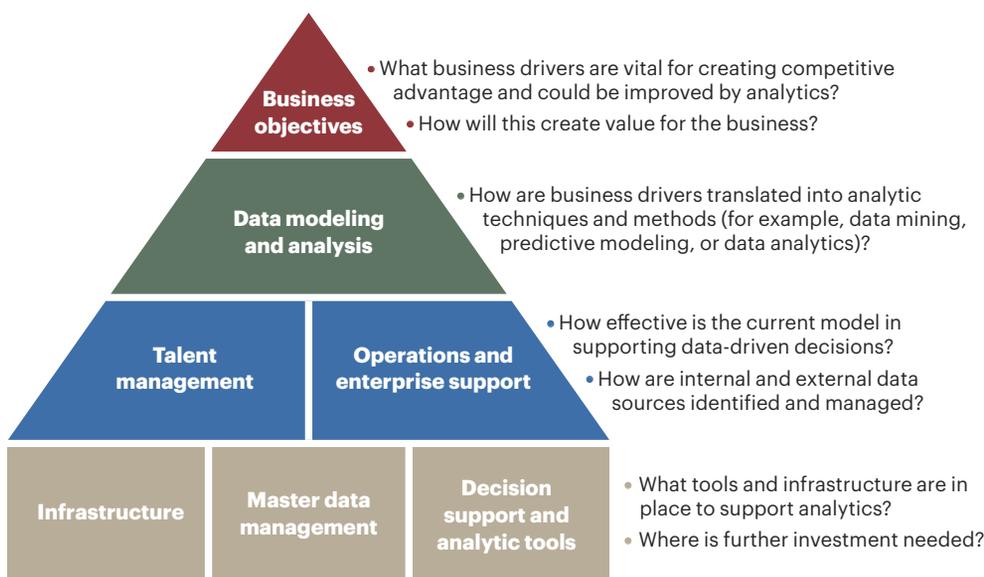
Developing a world-class analytics capability is about far more than consolidating terabytes of enterprise data into a reporting data warehouse. Rather, it's about using that data to change the organizational culture, drive revenue, and improve the quality, service, and cost of care.

At one client, however, we found that business analysts spent 80 percent of their time collecting, cleaning, and normalizing data, and only 20 percent analyzing what they collected. Furthermore, providers often face an overwhelming number of reports, many redundant or no longer useful, but time-consuming to create and expensive to maintain nonetheless.

Some leading healthcare providers have developed enterprise-wide models that improve the predictability and control of their performance, but they didn't do it overnight. Instead, they systematically built an advanced analytical function over time. Consider DaVita, a major kidney care provider in the United States. DaVita's CEO, whose motto was "no brag, just facts," wanted to build a culture of analytics across the organization and spent millions of dollars over several years to do just that, including the establishment of "DaVita University." Reports and meetings start off with data on the effectiveness of dialysis treatments and on patient health and well-being. Facility managers also receive eight-page monthly reports that include a quality-of-care index and a variety of operational measures such as treatments per day, labor hours per treatment, and employee retention.⁴ It is probably no coincidence that DaVita has been recognized by *Fortune* magazine as the top medical facilities operator in innovation, long-term investment, and quality of products and services.⁵

Companies should resist the temptation to address gaps in analytic proficiency by throwing technology at the problem. Indeed, IT solutions are crucial for enabling an organization to conduct and share analyses, but they rarely are the place to start. Most organizations will have varying degrees of proficiency across the dimensions of capabilities, processes, and systems; there's little need to reach the highest stage of excellence in all of them. Rather, the goal is to find the right areas of focus to achieve the analytic vision and to invest accordingly (see figure 5).

Figure 5
Identify the analytics focus areas and invest accordingly



Source: A.T. Kearney analysis

⁴ Jeffrey Pfeffer and Robert I. Sutton, "Profiting from Evidence-Based Management," *Strategy & Leadership* 34, no. 2 (2006): 35-42

⁵ "World's Most Admired Companies: DaVita HealthCare Partners Snapshot," *Fortune*, 18 March 2013

As described earlier, analytics' functional and business objectives are defined together with the organization's main stakeholders, and gaps in capabilities, processes, and systems are then identified against these objectives. Among the questions to examine are the following:

- Where has analytics proved to be most effective? In revenue cycle management? In improving clinical outcomes? In matching staffing or resource levels to demand?
- How do employees' analytics capabilities stack up against those of their peers at similar organizations?
- What analytic techniques are already used? Data mining? Predictive modeling? Database analytics?
- How effective is the current analytics support model in promoting data-driven decision making?
- What tools and infrastructure should be in place?
- What is the third-party engagement strategy?

The answers to questions such as these determine where to act to raise the enterprise's analytical IQ.

Developing a world-class analytics capability is about using that data

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Quantify Value to the Business

Most experts agree that an analytics function can be a powerful enabler. But while calculating the function's up-front and operational costs is relatively straightforward, quantifying its benefits is not. And the inability to assemble a solid business case has discouraged many healthcare organizations from embarking on an undertaking that can be costly, time-consuming, and disruptive.

Value-driven analytics addresses this issue by quantifying, in concrete terms, the expected cost and revenue impact of analytics. Using a combination of external benchmarking, discrete analyses of sample data, and stakeholder engagement, an opportunity assessment is performed to define—and place a dollar amount on—analytics-intensive improvement initiatives (see sidebar: Analytics Adds Up on page 9).

The initiatives can be of many different natures. On the clinical side, for example, reducing the number of readmissions and emergency room visits not only improves patients' quality of life, but can also have a major impact on profitability for integrated care systems or for providers

Analytics Adds Up

One provider, encouraged by its success in clinical analytics, used a bottom-line-focused approach to identify millions of dollars' worth of impact from improving its capabilities in operations (see figure). First, a cross-enterprise business team identified over a dozen initiatives that required an investment in analytics to create the maximum

impact. Next, the team put together individual business cases that clearly articulated benefits such as cost reduction or revenue improvement. Most importantly, initiatives were assigned to individual sponsors—senior managers who believed that advanced analytics were the step change needed to respond to the demands of internal

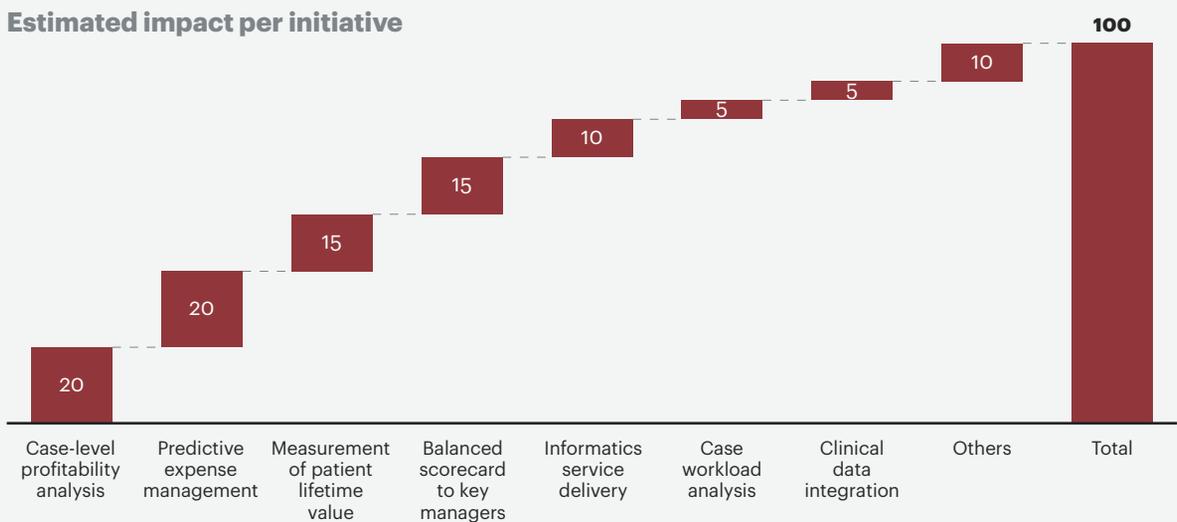
and external stakeholders. Additionally, the link between enhanced analytics proficiency and concrete initiatives allowed the team to define major milestones throughout the complex transformation journey and deliver tangible benefits along the way.

Figure

Linking analytics to the bottom line

Example

Estimated impact per initiative



Note: The numbers have been modified to protect client confidentiality.

Source: A.T. Kearney analysis

no longer operating under a fee-for-service model. Effective statistical analysis of historical patient and clinical data can identify relevant predictors of preventable rehospitalization; these predictors can be used to adapt treatment protocols for certain groups of patients. Combined with data collected after patient discharge—say, via remote monitoring—they can be used to trigger alarms that set in motion earlier, lower-cost interventions outside the hospital setting. Metropolitan Chicago's NorthShore University Health System, for instance, uses predictive modeling to identify recently discharged patients with a high risk of readmission and notifies their primary care physicians of recommended follow-up appointments.⁶

From an operational perspective, many providers are challenged to find the optimal mix of clinician skills and facilities needed to prevent, treat, and manage patients. Utah-based

⁶ Kathleen Roney, "The Rise of Big Data in Hospitals: Opportunities Behind the Phenomenon," *Becker's Hospital Review*, 21 December 2012

Intermountain Healthcare uses analytics to constantly improve its evidence-based protocols, which has led to increased staff productivity, lower overhead, and better health outcomes. This technique allowed Intermountain to reduce elective induction of labor before 39 weeks of gestation from 28 percent to less than 2 percent in 10 years, meaning it can also deliver about 1,500 additional babies per year without increasing the number of beds or nursing staff.⁷ As it was also dramatically reducing 90-day readmission rates for heart failure and sepsis mortality rates, it managed to consistently reduce salaries as a percentage of net revenues, too.⁸ Sophisticated data mining of clinical, demographic, and operational data can also isolate key trends in chronic illnesses and ensure that resources are well aligned with demand.

Increasingly, providers are turning to value-based analytics to develop a data-driven decision support model.

Consider, too, the possibility for providers to monetize clinical data through agreements with large pharmaceutical firms, so long as data is appropriately de-identified and regulatory hurdles can be overcome. In the United States, companies pay on the order of \$2.5–5 million for smaller randomized clinical trials, and as much as \$15–20 million for larger-scale trials, so the pool is indeed sizable.⁹ Also, in many countries payers require pharmaceutical companies to conduct ongoing pharmacoeconomic studies, even after marketing authorization has been granted. Given that pricing and reimbursement decisions largely depend on the results of these studies, laboratories have a lot of value at stake in the data and analyses required to support them.

Better Living through Analytics

Developing, delivering, and managing analytic capabilities entails meticulous change management. Executive-level sponsorship is needed to create a sense of urgency and provide support for those driving the transformation effort. Early tangible results show that previously challenging or time-consuming analyses are now much easier. The emphasis is on what analysis is being conducted and how it is being acted upon, not on how many instances of a piece of software are installed on employees' computers.

Service-level agreements and performance metrics are used to clarify what is expected of the different teams, including personal objectives for analysts to promote data-driven analyses and insights. Perhaps most importantly, top management is ever vigilant to ensure that the insights revealed through data analytics actually change the way operational and clinical decisions are made about care.

⁷ Brent C. James and Lucy A. Savitz, "How Intermountain Trimmed Health Care Costs through Robust Quality Improvement Efforts," *Health Affairs* 30, no. 6 (2011): 1185–91; Bryan T. Oshiro, Erick Henry, Janie Wilson, D. Ware Branch, and Michael W. Varner, "Decreasing Elective Deliveries Before 39 Weeks of Gestation in an Integrated Health Care System," *Obstetrics & Gynecology* 113, no. 4 (2009): 804–811

⁸ David D. Clark, Lucy A. Savitz, and Scott B. Pingree, "Cost Cutting in Health Systems without Compromising Quality Care," *Frontiers of Health Services Management* 27, no. 2 (2010): 19–30; Greg Poulsen, "Improving Quality, Lowering Costs: The Role of Health Care Delivery System Reform," Testimony before the U.S. Senate Health, Education, Labor, and Pensions Committee, 10 November 2011

⁹ Erin Holve and Patricia Pittman, "A First Look at the Volume and Cost of Comparative Effectiveness Research in the United States," *AcademyHealth*, June 2009

When properly implemented, advanced analytics can bring about transformative improvements in healthcare praxis, economics, and outcomes—a meaningful and very necessary win-win proposition for stakeholders across the board. Looking ahead, it even offers the prospect of combining and analyzing a broad range of historical data about a patient’s care with a growing list of new types of data—including genomic data, medical images, genetic and molecular research findings, unstructured physician notes, and prescription data—to bring us closer to personalized medicine.

In today’s uncertain environment, data analytics may seem to hold out a very distant promise to harried healthcare providers struggling to meet more immediate challenges. But circumstances can change drastically at the drop of a hat, and, as the saying goes, an ounce of prevention is worth a pound of cure.

Authors



Khalid Khan, vice president, Chicago



Michael Wise, partner, New York
michael.wise@atkearney.com

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