



**The Changing Landscape
For U.S. Healthcare Providers:
Current and Emerging Trends for
The Data-Driven Enterprise**

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Introduction

Healthcare providers today are undergoing a fundamental shift in the way they do business, and are doing so at an unprecedented pace. New demands from government, payers and patients are causing a large transformation as providers look for ways to manage risk, increase their quality of care, reduce costs and navigate new payment models. This massive shift has caused providers to increasingly leverage their own clinical and financial data for critical insights.

SAS, a leading vendor of business analytics software and solutions, commissioned NewGrowth Consulting, a Seattle-based IT research and consulting firm, to conduct research with leading providers and to share their insights through this white paper.

NewGrowth conducted in-depth interviews with 35 C-suite executives representing 30 leading healthcare providers across the U.S., investigating their business priorities, current use of data for decision making, and their plans for gaining new insights from clinical, operational and financial data.

Health reform and a rapidly changing landscape make this a unique opportunity to explore and understand how U.S. providers are transforming into data-driven enterprises. We hope this paper encourages discussion and planning within your own organization to operate successfully in this new environment.



Key Themes from Research

Research uncovered five key themes describing providers' adoption of analytics for their organizations:

- Government mandates are dominating business priorities
- Data connectivity is key for understanding patients and measuring performance
- Declining reimbursement rates and accountable care are accelerating the need for data-driven decision making
- Providers are transforming into data-driven enterprises
- Providers are shifting from reactive to proactive analytics

“We have a perfect storm facing us – Meaningful Use, ICD-10 and Healthcare Reform... we’re making big IT investments, trying to catch up very fast.”

“Front and center is cost reduction due to reduced reimbursement rates. Can we function on Medicare reimbursements? Healthcare exchanges may drive costs down even further.”

1. Government Mandates are Dominating Business Priorities

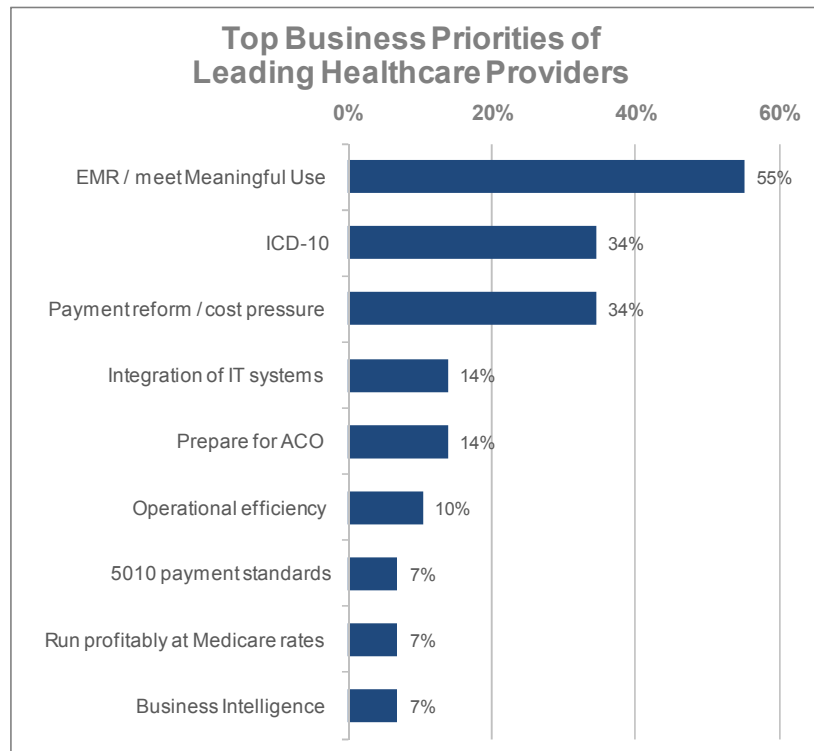
Business priorities for leading healthcare providers are being driven by legislation stemming from Health Reform. Many are in the midst of system-wide EMR implementations to meet Meaningful Use requirements; at the same time, they are in the midst of a major transition from ICD-9 to ICD-10 coding.

Changes to reimbursement rates and performance-based payment models present further challenges to providers: how can they improve care quality, reducing the need for hospital visits and yet remain profitable under lower reimbursement rates?

Faced with these issues, providers are increasingly turning to their existing clinical and financial data for answers.



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Mandates Are Paving the Way to New Insights

Government mandates are not only stimulating providers' need for better information; they are also driving development of better IT systems. Providers' focus on mandate-driven major IT projects, such as EMR implementations, and required reporting to government and payers, is fundamentally changing the way data is collected, stored and accessed. Clinical data, which often resides in disparate and disconnected systems, is rapidly moving into fully-integrated systems which connect patient health records, imaging, labs and medication information. Financial data is similarly being consolidated. Providers are also building or upgrading data repositories, such as electronic data warehouses and data marts. These improvements to IT infrastructure have the potential to make analysis of provider data easier than ever before.



“We plan to use clinical data and cost data to develop more sophisticated care management and intervention processes.”

“We need to understand the cost of care. We also want to measure profitability by physician – service line data is not good enough. For payer negotiation, we’ll need a powerful analytics engine.”

“Payers know more about us than we do...”

2. Data Connectivity is Key for Understanding Patients and Measuring Performance

Leading providers are highly focused on integrating clinical data throughout the enterprise and storing data in common repositories.

Connecting Clinical & Financial Data for Analysis

Many providers are currently engaged with data warehousing projects and other initiatives which connect clinical and financial data. Linking the two enables a comprehensive view of operational efficiency, patient outcomes, cost of care and financial risk. A number of providers are trying to go beyond department-level reporting and measure the performance of individual physicians.

Connecting Inpatient and Outpatient Clinical Data

A number of health systems are either planning or beginning to connect their inpatient and outpatient data, for more comprehensive insights. By understanding patients across the full spectrum of their care, executives see opportunities to improve management of chronic diseases, predict patient volume, and increase operational efficiency.

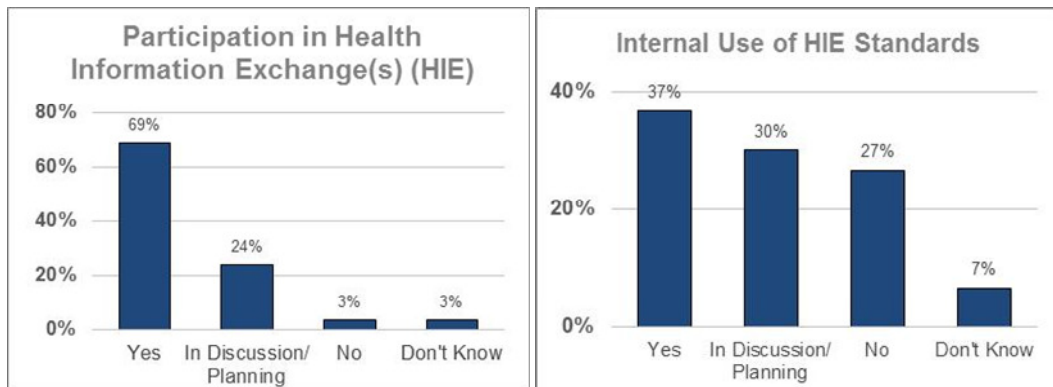


Connecting to External Data

The push toward external connectivity is reaching critical mass – the ability to connect to external data is now considered imperative. Sixty-nine percent of the provider organizations interviewed participate in one or more Health Information Exchanges (HIEs). HIE data presents a larger pool of data for analysis, enabling a better understanding of the populations they serve.

Sixty-seven percent of the same providers are either using or planning to use HIE standards internally. HIE standards facilitate the sharing of patient data with non-affiliated providers, independent practices and provider organizations outside of the HIE region. In some cases, providers are using HIE standards as a temporary solution for sharing data between disparate clinical systems, such as ambulatory clinics and newly-acquired hospitals.

Beyond HIEs, leading providers are looking to increase their connection to comparative data sources for benchmarking and for setting internal performance measurement. Many providers indicate a need for support with aggregating data from external sources, as well as more robust tools for real-time analysis and predictive modeling.



Trends for IT Purchasing

We see two key trends with IT purchases related to data connectivity needs. First, providers are consolidating their clinical systems with a single IT vendor. This includes academic medical centers, where best-of-breed vendor selection has been most prevalent. Providers are looking to vendor consolidation as a way to facilitate data standardization, from common dictionaries to data mapping between departments.

Second, many providers are planning or have begun large data storage projects, including enterprise data warehouses and data marts. Providers' need to aggregate clinical and financial data from multiple sources has created the need for a common data repository to serve as a "single source of truth."



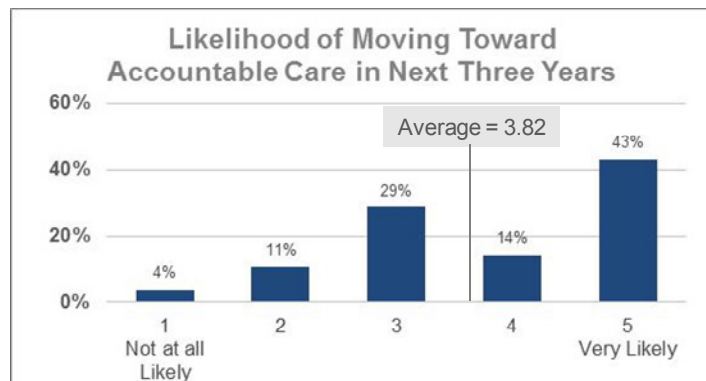
3. Declining Reimbursement Rates and Accountable Care are Accelerating the Need for Data-driven Decision Making

Many executives responsible for their organizations' strategy see declining reimbursement rates and a transition away from fee-for-service and towards accountable care as the future for U.S. healthcare. Payment reforms are driving a number of initiatives with Medicare and providers' own employee insurance programs, to test-drive new payment models and quickly gain experience in advance of future legislation. Changes to payment models and reimbursement rates are spurring an urgent need for identifying ways to reduce costs, estimate future revenue and assess financial risks. Providers also want to understand the true cost of care, increase efficiency, improve outcomes and negotiate with payers.

“We’re trying to drive 50% of total revenue to accountable care in the next 3-5 years. We expect commercial will be at 60% and Medicare will be 100% accountable.”

“For outpatient, we expect to be 50-75% capitated. Estimating ACO for inpatient care is very tough. We are responding to payers at this point.”

“We expect in five years' time 25% of revenue could come from risk-based contracts. We're looking to be our own health plan in 5-7 years.”



Payment reform is already driving large changes in the way providers think about their missions. Providers are looking to analytics for insights on managing population wellness, especially for patients with chronic diseases. As an example, providers seeking to understand the impact of payment reforms are running analysis to see whether they can remain profitable under current Medicare rates.

Understanding the cost of care, reducing readmissions, and improving clinical decision making are top objectives in this new paradigm.



4. Providers are Transforming into Data-driven Enterprises

“Our analytics are very rudimentary – we’re trying to manipulate data in Excel files.”

“Why does clinical variance cost us so much? We can’t answer. We have disparate data in disparate systems giving us different assumptions... clinical analytics are labor-intensive.”

Feeling Behind the Curve

A number of C-suite executives see themselves as unprepared, from a systems perspective, to meet the new healthcare landscape. Whether due to a lack of data governance, lack of planning for data analysis, or focus on compliance with federal mandates, providers are acutely aware they are in need of better information to make critical decisions for their organizations.

“We don’t know what we don’t know. Where is the vision of where we need to be?”

The Importance of Data Governance and Data Standards

The definition of data governance is still evolving, but basically it describes the comprehensive framework of personnel, processes and IT systems used to make data available throughout the enterprise. Each part of this framework is necessary for accurate and consistent data collection, storage and access.

As data becomes integrated – clinical and financial, inpatient and outpatient, internal and external – data quality and data standards become an especially important area of focus for data governance initiatives. Key components include:

- **Common Data Repository** - enterprise data warehouses or data marts which serve as the “single source of truth,” from which data is drawn for analysis
- **Common Dictionary** – defines terms used in clinical and financial systems across the enterprise, including outpatient clinics and recently acquired facilities
- **Standardized Problem List** – a common list of patient problems used by all practitioners in the provider organization
- **Enterprise Master Patient Index (EMPI)** – a master index used for patient identification and matching, enabling a comprehensive, single view of a patient

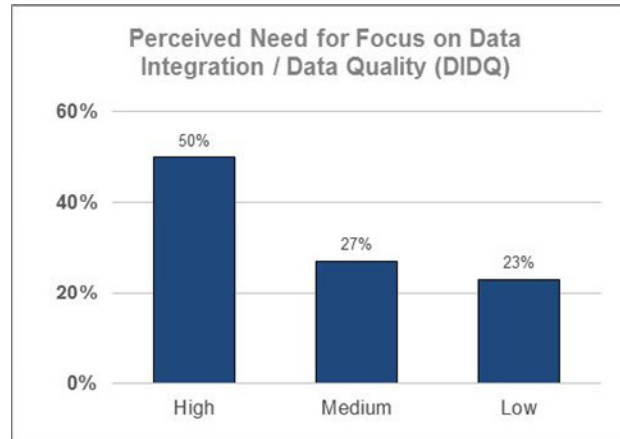


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A number of providers mentioned that the need for data standards was not fully considered in their IT plans. Providers now cite a number of challenges with standardizing their data, such as developing standardized problem lists and common dictionaries.

“Data has been residing in six different silos – we need to have a single source of data for analysis and reporting. Internally, we need to standardize on nomenclature and definitions, appoint a steering committee.”

“Standardization is the big issue for us. Physicians have to have a way to classify patients so we can deliver alerts more intelligently. We need to have a good problem list as well as a good diagnosis list.”



Based on comments from C-suite executives, NewGrowth anticipates data quality and data standards will remain a top priority among healthcare providers for the next three years at a minimum.

“We need to standardize definitions. For example, how do you count an FTE – call hours? Surgical counts?”

Staffing for Analytics

Providers are struggling with how best to staff for analytics. Many have appointed analytics leaders (often senior IT or informatics executives) who in turn work closely with clinical, financial and operations leaders to understand enterprise-wide and department level requirements. Given the rapidly changing landscape for healthcare data, clinical measures and reimbursement, most learn as they go.

For executive reporting on key organizational metrics, often the IT department becomes the central hub for designing and publishing static reports. BI tools are prominent in this space, but are seen to lack the advanced statistics and predictive modeling capabilities needed by providers.



“Our analytics are pretty fragmented – we have four to five different analytics sources... We lack data governance, we lack stewardship, we don’t have a strong analytics leader or a data architect. We need an ETL specialist. We have no meta data standards or dictionary, which leads to data integrity issues and arguments.”

Providers often rely on analysts at the department level to run ad hoc queries; however, not all departments in need of analysis have the staff they need and the process is often labor-intensive. Because analysts have been typically added organically on an as-needed basis, organizations have the added challenge of setting standards for analysts’ skills and tools used for performing analytics.

Looking Beyond BI and EMR

Pressures from the changing healthcare landscape are causing many large providers to reach outside of their Business Intelligence (BI) and EMR vendors for analytics expertise. Providers recognized as analytics leaders, such as Montefiore and Geisinger, are leveraging their investments in self-developed tools by selling services and solutions to peer organizations.

Providers are also collaborating with each other more than ever. Accountable care has led to joint ventures and alliances, including analysis of data. Providers have begun collaborating with payers and even competitors in pilot projects to share resources as they navigate new regulations and business models.

Finally, specialty analytics vendors and professional service firms are emerging as prominent leaders in healthcare analytics, leveraging vast experience gained from work with pharmaceutical and insurance companies. Advantages include reduced time to development and implementation, reduced risk of errors, and best practices gained from engagements with a wide variety of organizations.



“Our business leaders are oriented toward end-use – eye candy – they don’t connect with the underpinnings such as the need to standardize data. They want a magic bullet, they expect an analytics tool to be something you slap on top [of a database] and do everything you want.”

Identifying Analytics Priorities

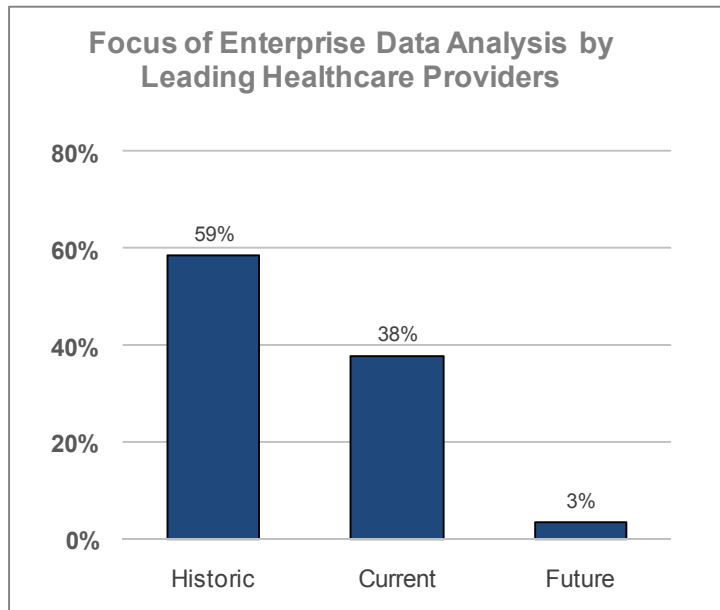
Which specific analytics should be implemented, and what are the best methods to do so? Many providers are struggling with these questions. Some are looking to their EMR vendors, others are trying to squeeze functionality out of their existing BI solutions, while a rare few are developing their own custom solutions. At the same time, data integration, data standardization and enterprise data warehouses may not yet be in place for these organizations.



5. Providers Are Shifting from Reactive to Proactive Analytics

A shift has been under way from historical to more proactive forms of analysis, including analysis of real-time data and predictive analytics. Today, nearly 40% are relying primarily on current data for decision making:

“We had been relying on historical data. We would like to get to forecasting for proactive care, like predicting hospital acquired infection. For example, how can we improve our protocols to reduce infection rates?”



Providers need access to real-time data, analytic tools to investigate clinical and financial causes and effects, and the ability to get data into physicians’ hands in a timely manner. Based on our research, NewGrowth estimates most large providers will have made the shift to analyzing current data in the next 18 to 36 months.

“In the past we used historic data, but that doesn’t work for making key changes. Now we’re using current data as much as we can. We haven’t done a good job of getting information to enable analysis of the future.”

Forward-thinking users of analytics have begun or are planning to use predictive analytics in their organizations. Accountable care, shared savings / shared risk, cost reduction and quality of care delivery are the most cited drivers for moving towards predictive modeling. NewGrowth expects a further shift from current to predictive analytics for the majority of large U.S. providers within 3-5 years.



“We have 10 data priorities. Four to five are using historic data, centered around quality and cost. We’re looking to predictive modeling to create what-ifs with order sets for DRGs. We also expect to use predictive modeling for accountable care to see if we’re making money.”

Solution Needs

Leading providers consistently see a huge need for improved IT solutions to support key business initiatives – well beyond their clinical systems and existing analysis tools.

Top areas where C-suite executives want better solutions include quality measurement, managing financial risk, and clinical decision making.



Quality Measurement and Improvement of Care Delivery

Measuring quality lets providers know how they're performing, identify gaps in care or patient outcomes, and can help reduce the variance in care between physicians in the same department.

“If we're taking on the risk of managing a defined population, we had better have tools to monitor their health.”

Managing Financial Risk

Value-based purchasing, accountable care, shared savings, shared risk and bundled payments will each mean changes to care delivery and reimbursement. Providers need to understand the financial impact of new payment models, to determine how to align care delivered and costs of care to reimbursement. Analytics are crucial for payer negotiation, cost reduction, operational efficiency and staffing.

“Physicians need quantifiable data in order to make changes.”

Clinical Decision Support

Providers want real-time data and evidence-based medicine to drive clinical decisions, from identifying at-risk patients, knowing when to intervene, and which care protocols result in the best patient outcomes.

Sources of Analytics Solutions

In the search for analytics solutions to solve their most pressing analytics needs, providers are turning to several sources:

- EMR vendors – as major sources (or sole sources) of clinical data, providers are looking to extend EMR reporting functionality beyond government and payer requirements. Providers, however, cite limited flexibility in reporting, challenges collecting data from external sources and a lack of mathematics necessary for predictive modeling.
- Business Intelligence vendors – many providers have invested in BI tools, such as Cognos and Business Objects, which sit on top of data warehouses or alongside clinical systems. Advantages over EMR reporting include quicker ad hoc queries, attractive graphics and dashboard capabilities; however, providers cite limitations in deep analytics, notably a lack of predictive modeling functionality.



- Self-developed solutions – analytics leaders, such as Intermountain, Geisinger and Montefiore have proven that internally-developed solutions can meet their needs before commercial solutions are available. Several offer their solutions to other providers, helping to offset development costs. While this is a viable route for providers with enough expertise and resources, most large providers say they do not have the time, expertise or risk tolerance for developing their own analytics solutions.
- Analytics vendors – providers are increasingly turning to solution vendors and third party consultants with expertise in advanced mathematical modeling and which have healthcare-specific experience and professional services staff to adapt their solutions to each provider’s unique data environment. Advantages include vendor-agnostic architecture, flexibility for both ad hoc queries and regular reporting, predictive modeling capabilities and limitless customization to each organizations’ specific requirements. At present, these solutions are not off-the-shelf and require some degree of professional services.

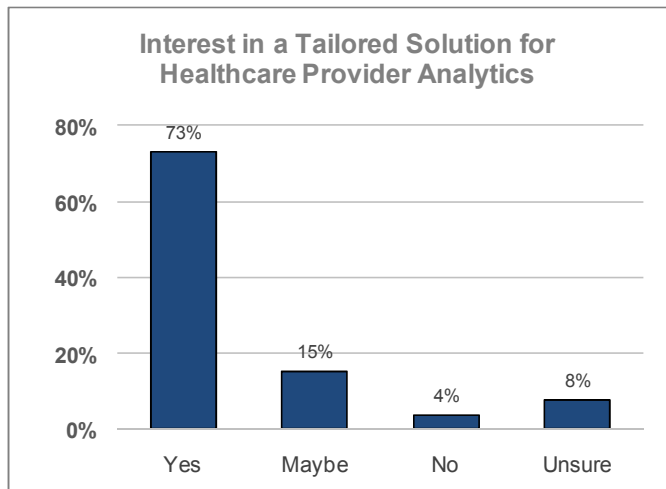
“We need to get past seat-of-pants knowledge and understand the cost of tests, treatments, and drugs. We need to understand what are optimal therapies, as opposed to old training from medical school.”

Tailored Analytics Solutions

What, then, is the best course of action for providers, given their pressing challenges and need for better analytics? Providers’ comments about their existing analytics sources led NewGrowth to test whether a tailored analytics solution, consisting of software, analytics modeling and professional services would be of interest:



“We would be looking for the ability to short-circuit our time to results, accomplishing more analysis rapidly to drive value.”



Findings indicate leading providers understand their needs are complex, and that their organizations have a strong need for a focused solution which can meet their demands.

“We have so much at stake and can’t afford to make large mistakes. Time is our enemy at this stage. We are kicking the tires on various companies; we know we need a different state of analysis in the next 12 months.”

Analytics Success Stories

Evidence-Based Clinical Decisions – Intermountain Healthcare

“The American College of Obstetricians and Gynecologists (ACOG) recommends that physicians avoid inducing labor prior to 39 weeks. We ran some numbers and found that 27% of elective inductions at Intermountain were taking place earlier than 39 weeks. Our head of our Women’s and Newborn clinical program asked for analytics to understand the effects of induced labor from 37 weeks through 41 weeks and whether the ACOG guidelines were relevant to our patient population.

“We found that labors at Intermountain induced prior to 39 weeks were two to three times more likely to land newborns in neonatal intensive care and significantly more likely that newborns needed to go on a ventilator. We instituted new care protocols which limited early induced labor to cases where consulting



physicians agreed it was medically necessary. As a result, we saw a rapid drop from 27% of early induced labor down to 6%. Today it's about 2%. Thanks to this internal study, we can deliver 1,500 more babies at our facilities while saving millions annually in healthcare costs."

Central vs. Department-Level Staffing – A Large Midwest Integrated Delivery Network

"Our IT staff builds data marts in our enterprise data warehouse, which enables faster running of reports. We use department staff to create reports needed by each department. Being based in the department means they know the data better, and department leaders give better specs for analysis because they're paying for reporting staff."

Plan Ahead for Your Population – Duke University Health

"We used predictive modeling to support the business case for our cancer center building. We commissioned an external consultant to look at market trends, cancer growth rate projections, and potential market share capture. This helped us to properly size the cancer center in terms of capital outlay and cash flow."

Encourage Curiosity – A Large Midwest Integrated Delivery Network

"We fund a physician for one day per week for a six- or twelve-month period to conduct research that will improve care delivery. One doctor thought we may be missing hypertensive cases. We found 1,000 patients in our system who were suspect but not diagnosed as hypertensive and sent them a letter. Five hundred came in for a more advanced evaluation, 175 were truly hypertensive and are now getting treatment.

"If you have a temperature post-surgery, you may have an infection – which usually leads to ordering antibiotics, but every patient reacts differently to surgery recovery. We pulled data on 17 common surgeries, looking at patients by gender, age, temperature, and the number of days post-surgery. We gathered data over a weekend on more than 400,000 temperatures and analyzed them to give better information to the surgeons for healthcare post-surgery."



Conclusion

Healthcare providers across the U.S. are undergoing massive changes in the way they treat patients, measure physician performance, clinical outcomes and financial viability, negotiate with payers, and in the myriad ways they now use data for decision making in all these areas. Every C-suite executive interviewed for this research saw a need to improve the way analytics were used in their organizations, and each believes the demand for analytics in decision making will only increase in the coming years.

Providers who are currently transforming into data-driven enterprises have already seen important benefits to their organizations; most see analytics as necessary for operating effectively and holding their own against competitors.

Organizations behind in their analytics plans view the next 12 to 18 months as crucial to getting their IT systems and clinical staff ready for analytics. It has become clear to all that healthcare moving forward will rely heavily on adapting to a data-driven paradigm for serving patients and thriving in this new landscape.

About NewGrowth Consulting

Backed by research. driven by experience[®], NewGrowth Consulting is an expert provider of worldwide market research, go-to-market strategy and consulting to leading IT and healthcare IT companies. NewGrowth enables business-critical decision making for its clients by combining solid market research with deep knowledge of IT markets, business strategy and best practices.

<http://www.newgrowthconsulting.com>

About SAS

SAS is the leader in business analytics (sas.com/businessanalytics) software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 55,000 sites improve performance and deliver value by making better decisions faster. SAS is also the industry leader in health analytics software and services, delivering best-in-class solutions for improving medical care, strengthening financial performance, deepening customer relationships, and pursuing medical innovations (sas.com/industry/healthcare/provider). Since 1976 SAS has been giving customers around the world THE POWER TO KNOW[®].

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