



The Landscape of Data & Analytics in Healthcare

Results from 2014 National Survey of CIOs



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INTRODUCTION

The digitization of healthcare has resulted in tremendous new opportunities for using data to improve patient care and manage the health of populations. As hospitals and health systems move from paper-based to electronic records, the amount of available data has grown dramatically. Health information technology (health IT) can enable unparalleled access to novel data sources by linking disparate settings, specialties, and systems across the care continuum. Today, researchers, administrators, entrepreneurs, and clinicians alike are leveraging data and complex algorithmic models to inform decisions and strategies at an individual, organizational, and regional level. As delivery system transformation efforts take shape, many healthcare organizations have begun combining claims data and medical records to identify variation and overutilization of services, stratify frequent utilizers and high-risk populations, and suggest appropriate or cost-effective treatments to improve quality and reduce costs. However, the field of analytics is still relatively young in the healthcare industry; to date, capabilities and practices vary significantly across different settings and organizations.

In April 2014, eHealth Initiative (eHI) and the College of Healthcare Information Management Executives (CHIME) fielded an online survey to assess the use of data and analytics among healthcare executives. This document presents key findings from the survey.

BACKGROUND ON SURVEY RESPONDENTS

Ninety-eight healthcare organizations responded to the survey, including:

- Integrated delivery networks (35%)
- Hospitals (27%)
- Academic medical centers (14%)
- Community health centers/clinics (9%)

Nearly all of the survey respondents use analytics in some capacity. Only four reported that they are not currently running analytics.

KEY FINDINGS

The following findings were drawn after careful review of the survey results. More detail is provided below:

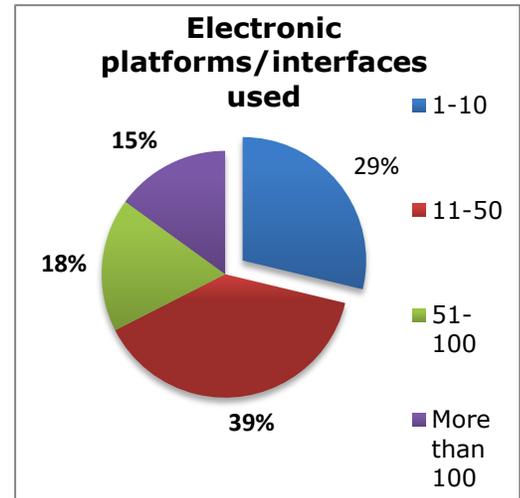
1. Data comes from many sources.
2. Analytics are still in early stages of maturity.
3. Organizations recognize the importance of data & analytics, but many have not committed to its investment or use.
4. New barriers to analytics are emerging beyond staffing, interoperability, and cost.
5. Consumer engagement is a growing business area.



KEY FINDING 1: Healthcare organizations are relying upon increasingly diverse types and sources of electronic data for analytics

Organizations leverage disparate systems to collect and analyze information. Seventy-two percent of respondents report using more than 10 platforms or interfaces to extract data. As organizations expand, consolidate, merge, or join connect environments with other business entities, data is also increasingly extracted from diverse sources.

Organizations predominantly rely on traditional sources: clinical data from EHRs (95%), pre-adjudicated administrative, billing and financial data (91%), and post-adjudicated claims data (69%). While approximately 45 percent of organizations pull data from patient portals and health risk assessments, 32 percent do not currently analyze patient-generated data. Novel data sources include remote monitoring devices (29%), health information exchanges (22%), or mobile applications (11%). Since 2013, a slight decline has been observed in analyzing unstructured text (39%) and genomic data (7%).



KEY FINDING 2: Analytics are still in the early stages of maturity.

To date, organizations largely rely on basic analytic operations for support. Descriptive analytics¹ are the most commonly used (94%) and are performed most frequently. Thirty-eight percent run descriptive analytics daily and 20 percent run them monthly. Predictive analytics,² by comparison are used less frequently. Only 68 percent of respondents use predictive analytics, and they're typically only performed on a monthly (25%) or quarterly (20%) basis. Two-thirds of respondents don't use prescriptive analytics.³ Only 20 percent of organizations report that analytic operations are regularly integrated and coordinated at an institutional level.

KEY FINDING 3: Organizations recognize the importance of data & analytics, but many have not committed to its investment or use.

Ninety-four percent of organizations believe that value-based care initiatives (e.g. patient-centered medical homes or accountable care organizations) rely on analytics for success. However, only 42% have implemented a flexible and scaleable plan for their analytics platform to adapt to the growing volume, liquidity, and availability of health data. Most respondents reported only moderate (44%) or minimal (34%) commitment to integrating analytics into practice.

¹ Descriptive analytics mines data for historical or retrospective analysis

² Predictive analytics forecasts outcomes, trends, or performance

³ Prescriptive analytics provides sophisticated models to optimize performance by using predictive modeling to recommend specific actions

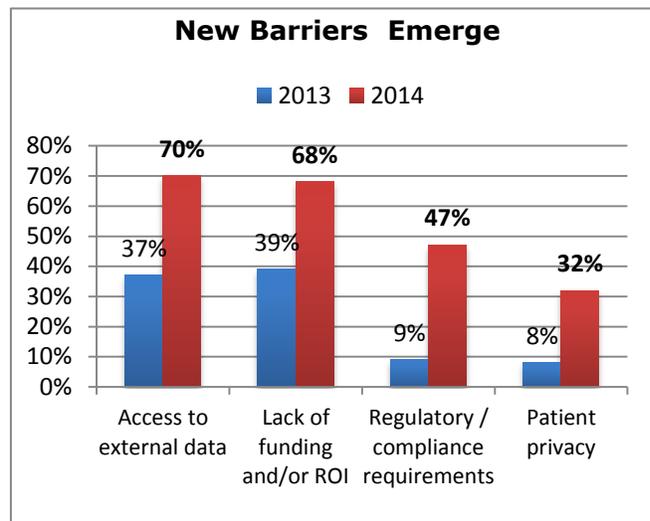
KEY FINDING 4: New barriers to analytics are quickly emerging beyond staffing, interoperability, and cost.

Staffing remains a critical challenge to effectively implementing analytics into practice. Seventy-nine percent of organizations lack sufficient trained staff to collect, process, and analyze data. Of these, 33 percent are trying to hire staff but have not found sufficiently trained candidates. Thirteen percent employ consultants or third-party organizations to fill the gaps.

As the number of data sources and types have proliferated, interoperable health information exchange was critical for analytic operations among 69 percent of organizations. However, 64 percent of organization also report that interoperability and inconsistent data formats are some of their most pressing challenges. In previous years, access to internal data has been a primary stumbling block for analytics – however, in 2014, 70 percent of organizations report access to external data beyond their networks as a major challenge.

When organizations are able to collect and capture data from various sources, managing the data is proving to be both difficult and expensive. Cleaning (37%), integrating (34%), and assuring the quality of data (29%) were viewed as cost-prohibitive activities. Lack of funding and/or return on investment was reported as a significant barrier by 68 percent of organizations, which in turn could exacerbate staffing challenges and the ability to effectively manage large amounts of data over time.

New challenges are rapidly emerging as healthcare organizations confront data liquidity. Compared with survey responses from 2013, the number of healthcare organizations that reported access to external data and lack of funding or ROI nearly doubled, while patient privacy and regulatory and compliance requirements more than quadrupled. These trends suggest the critical need for strategic planning in implementing analytics at an organization, no matter how large or small.



KEY FINDING 5: Consumer engagement is a growing business area.

While it may have lagged behind other major industries, healthcare is currently in the midst of a dramatic paradigm shift towards a consumer-centered focus. Two-thirds of organizations report using analytics to support consumer engagement (67%), most of whom are primarily concentrated on improving patient satisfaction (60%). However, few organizations are applying analytics to other consumer strategies such as personalized communication and services (29%), acquisition and retention of



consumers (28%), or development of targeted behavior change programs (24%). As more organizations collect and analyze patient-generated data, consumer-focused solutions are expected to grow, particularly as organizations seek to understand new patient populations that are entering the system under Medicaid expansion and the health insurance exchange marketplace.

Analytics continues to be used in the traditional areas of quality improvement (93%), revenue cycle management (91%), resource utilization (81%), and population health management (79%). Quality improvement solutions are largely applied to improving inpatient outcomes (75%), detecting adverse events (70%), and improving outpatient outcomes (55%). Common revenue cycle management activities include managing accounts receivable (76%), evaluation of performance indicators (63%), and financial modeling to support new reimbursement models (59%). Two thirds of organizations are optimizing resource utilization by analyzing physician performance and patient volume, length of stay, and/or wait times, while only 50 percent are focused on supply chain operations. Population health management activities are primarily utilizing analytics for risk stratification (51%), targeted outreach and intervention (50%), and leveraging registries for surveillance (46%).

DISCUSSION

Although analytics has the potential to radically transform care, most organizations are still in the early developmental phases. Data acquisition, integration, and management are a tremendous hurdle to overcome before organizations are often able to implement analytics effectively into practice. Within healthcare settings, the siloed nature of care has led to a myriad of legacy systems and clinical approaches which capture data in different ways.

During an expert panel discussion,⁴ Chuck Christian, Chief Information Officer at St. Francis Hospital, noted that “ascertaining what ‘good’ numbers are is difficult because each organization is going to have a different accounting practice or they’re going to gather data a little bit differently. Data governance, standardization, and normalization are going to be key.” Tom Gordon, Chief Information Officer at Virtua Health, described how care paradigms have shifted to focus on both community and clinical settings as data sources. “Access to data sources across the continuum is challenging. As we focus on wellness, we now have gyms, spas, retail clinics, and urgent care centers. Data that traditionally resided in clinical systems is now in point-of-service

“CIOs have increasingly significant workloads at a time when their staff is being reduced, their investments are being cut, and expectations for the value of HIT solutions are increasing. The promise of health IT can only be achieved if we’re focused on transformational efforts.”

- Russell P. Branzell, FCHIME, CHCIO
President and CEO, CHIME

⁴ The panel discussion occurred on May 6, 2014 during an eHI webinar sponsored by Health Level, Truven Health Analytics, and VitalSpring. The [webinar is available online](#) at the eHealth Initiative website.



systems that are more retail-focused.”

Given the nascent state of analytics, most organizations continue to work primarily with traditional data sources such as a clinical, claims, and administrative data. Dave Foster, PhD, Lead Scientist at the Center for Healthcare Analytics revealed that organizations will likely continue to rely on these sources because they are the province of high-profile federal quality efforts led by organizations like the Centers for Medicare & Medicaid Services (CMS) and Agency for Healthcare Research and Quality (AHRQ). “Their models for patient quality indicators are driven off of administrative data. There are actual reimbursement implications for hospitals, so using this data is crucial for understanding where they stand compared with other organizations in those programs.”

As analytics capabilities evolve and organizations seek out new data sources, the skills of the analytics workforce will need to evolve as well. Early analytics efforts were often run through IT departments. However, Mony Weschler, Chief Strategist at Montefiore Medical Center, noted a shift toward employing data architects who “aren’t necessarily as technical, but understand the process and the data, and can ask the right questions. They are a different resource that hospitals haven’t invested in.” Determining strategic priorities to address with analytics is complicated. It is not enough to gather data and search for relationships. “If you go through massive amounts of data, you can find a lot of associations, but whether those associations are meaningful or not can be difficult to discern,” echoed Foster.

“Analytics used to be based on simpler approaches to grouping patients. Now, to do things right, you have to have expertise in epidemiology, biostatistics, economics... As the sophistication has increased, so has the amount of knowledge needed to use technologies.”

- Dave Foster, PhD, MPH
Center for Healthcare Analytics

Other challenges include cost and culture. Analytic software can cost millions of dollars, confounding the value proposition for tools that may not have a readily measurable impact on the organization’s finances. In fact, the transformational nature of analytics can actually impinge on existing workflows and decrease productivity. Without a culture oriented around capturing information in a systematic way and a willingness to incorporate findings from analytics directly into practice, organizations may experience limited results or return on investment.

To navigate issues of funding and culture, leaders have sought to reframe costs in terms of value. Tom Gordon focuses on ways in which analytics provide a “return on value, bend the cost curve, improve patient safety and quality, and help manage the patient population,” rather than recouping implementation and operational expenses. Mony Weschler stressed the overall importance of technology to modern healthcare, noting that some clinical specialties can’t function today without advanced health IT systems. “The organization has to understand that you need to manage the patient from all aspects. Once you start collecting the data, it’s essential to survival.” Chuck Christian compared analytics to essential infrastructure: “I don’t know too many businesses that



do an ROI on their parking lot, but they'd better have one if they want customers. If we don't have these things, we can't compete."

CONCLUSION

In only a few short years, the adoption of electronic health records and other technologies has had a profound impact on healthcare organizations. Hospitals, health systems, and small practices alike have new opportunities to incorporate electronic health data from disparate systems and use analytics tools to drive actionable insights to improve care. However, to successfully use analytics, leaders must navigate difficult barriers such as interoperability, high costs, and analytically oriented staff. Results from the 2014 Data & Analytics Survey suggest that although many organizations are well on their way to leveraging the value of analytics, much work remains.

2014 LIST OF SURVEY RESPONDENTS

On behalf of eHealth Initiative and the College of Health Information Management Executives, we would like to thank the anonymous respondents and participating organizations below who completed the survey:

Allina Health	Henry Ford Health System	San Juan Regional Medical Center
Arkansas Children's Hospital	Highlands Health System	San Mateo Medical Center
Aspirus	Horizon Health Care, Inc.	Sharp HealthCare
Athens Regional Health System	Hospital Corporation of America	Southern Illinois Healthcare
Atlantic General	Hospital Sisters Health System	St. Elizabeth Healthcare
Augusta Health	HSHS	St. Francis Hospital
Baptist Medical Group	Huntsville Hospital	St. Peter's Health Partners
Benefis Health System	Inova Health System	Stormont-Vail Healthcare
Bon Secours Health System	JPS Health Network	Summit Health
Brazosport Regional Health System	La Clinica	Susquehanna Health
Brooks Rehabilitation	La Rabida Children's Hospital	Trinity Mother Frances Health System
Capella Healthcare	Legacy Community Health Services	TriRivers Health Partners
Central Georgia Health System	Lexington Medical Center	Truman Medical Centers
CGH Medical Center	Lima Memorial Health System	UCSF
Chase County Community Hospital	Lynn Community Health Center	UMass Memorial Health Care
Children's Hospital and Medical Center	Mary Washington Healthcare	Unity Health Care
Clark Memorial Hospital	MSI	University of Mississippi Medical Center
Community Health Network	Nationwide Children's Hospital	University of New Mexico
Cook Children's Health Care System	New Hanover Regional Medical Center	Urban Health Plan, Inc.
Discover Enterprises	North Texas Accountable Healthcare	UT Health Science Center at Tyler
Ellis Medicine	North Texas Regional Extension Center	Valley Health
Flagler Hospital	Orlando Health	Valley-Wide Health Systems, Inc.
George Hospital Association	Palo Alto Medical Foundation	Virtua Health
Grand View Hospital	Palomar Health	VITL
Greater Hudson Valley	Parkview Health	WellSpan Health
Hawaii Pacific Health	Premier Health	Winchester Hospital
Health Diagnostic Laboratory, Inc.	PrimaryPlus	YRMC
Health Plan of San Joaquin	ProHealth Care	
HealthEast Care System	Rady Children's Hospital San Diego	
HealthSouth	Rochester General Health System	
Henry County Health Center		