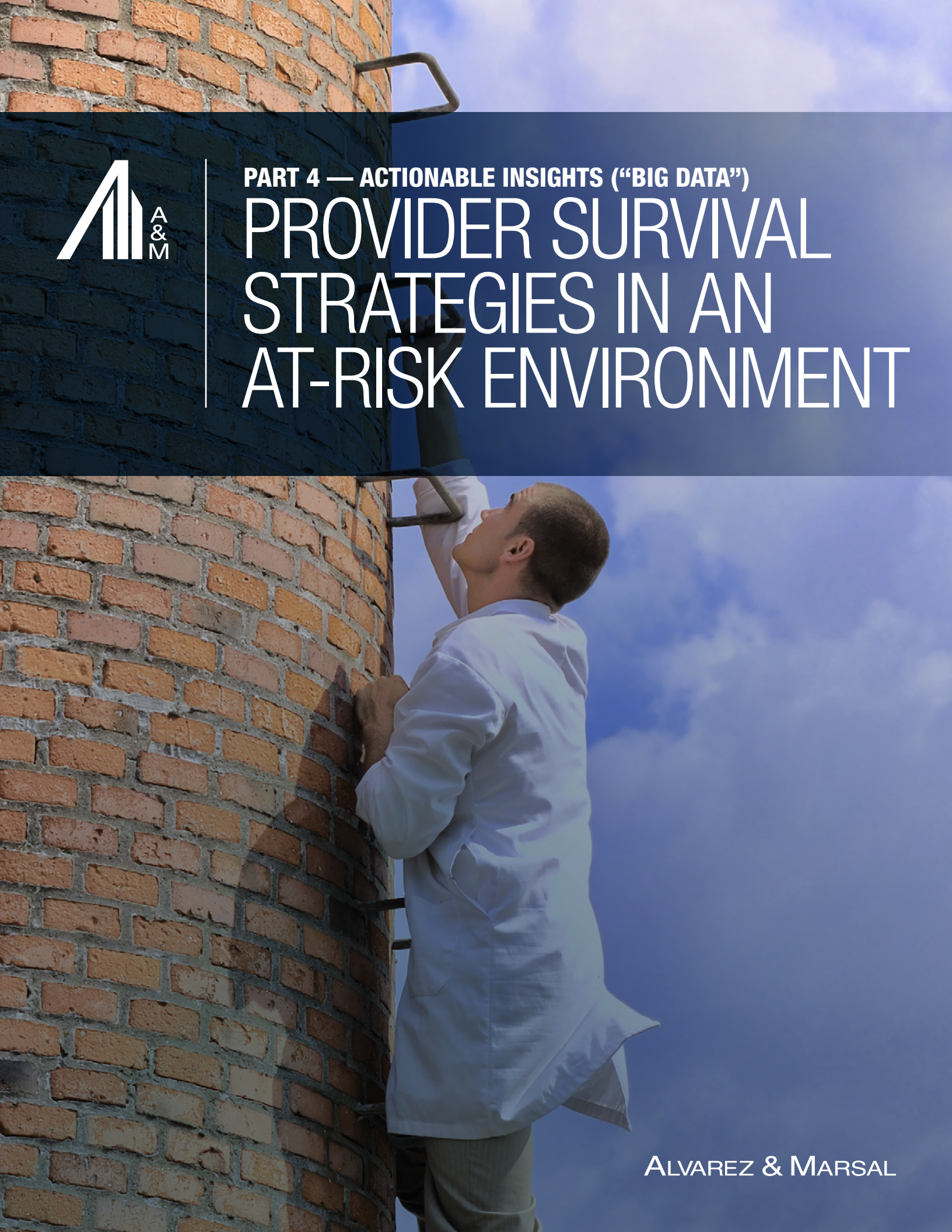

PART 4 — ACTIONABLE INSIGHTS ("BIG DATA")

PROVIDER SURVIVAL STRATEGIES IN AN AT-RISK ENVIRONMENT

ALVAREZ & MARSAL

For all inquiries, please contact:
David Gruber, MD, MBA
Managing Director and Director of Research
+1 212 763 9801
dgruber@alvarezandmarsal.com

Provider Survival Strategies in an At-Risk Environment – Full Report
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In this compilation of a six-part series, A&M is focused on providing context for the actions deemed necessary by providers to succeed in an increasingly at-risk, value-based environment. All healthcare is local. Siloed activities now require convergent integration. Each provider needs to consider federal (Medicare) and state (Medicaid) reimbursement and regulatory initiatives, local market conditions such as demographics, socioeconomics, competitive intensity, market share and relative performance, and its own capabilities and risk profile.

https://www.alvarezandmarsal.com/insights/provider-survival-strategies-risk-environment

ACTIONABLE INSIGHTS ("BIG DATA")

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 allocated $18 billion as incentives for hospitals and physician practices to become meaningful users of electronic medical records and allocated an additional $2 billion to promote health information exchange and use of personal health information by consumers (patients). Despite an increase in the percentage of hospitals with advanced (HIMSS Stages 5–7) health IT capabilities, from 6.1 percent to 70.2 percent, and ambulatory (non-hospital) physician practice adoption of 35.8 percent, the results have been disappointing. Physician productivity has declined, and health information exchange remains challenging. Financial incentives were not available to post-acute care providers (e.g., skilled nursing facilities, home care), integral components of the care continuum.

EMRs have not only contributed to an increase in reimbursement, but also a decrease in physician productivity. Studies have suggested that EMRs have created more screen time and less patient contact for physicians. Health information exchange within and between healthcare systems has been limited by interoperability challenges among vendors.

The "big data" revolution has resulted in the identification and aggregation of data from disparate sources, i.e., improved data management and reporting. However, data extraction remains a challenge. The reporting of data ("dashboards") is far different than the generation of insights that enable improved decision-making, i.e., actions that lead to measurable progress.

The Institute of Health Improvement (IHI) framework for operational excellence, known as the Triple Aim, is focused on improving the health of a population, the experience of care and on reducing the per capita cost of care. Data analysis and the use of advanced analytics are essential to their attainment. Transformative, insights-driven approaches to care delivery, risk management, physician alignment and patient engagement are required.

Providers with access to timely electronic medical record data potentially have a competitive advantage over payers. Claims data is retrospective, with a lag of at least three to six weeks, and is process rather than outcome oriented. EMR data is real-time and quantitative, and allows clinicians to better manage patients on a timely basis. In an at-risk, value-based environment, process-of-care enhancements, combined with a reduction in provider variation, can result in substantial improvements in efficiency and effectiveness.

DATA INFRASTRUCTURE

The goal of the Health Information Technology for Economic and Clinical Health (HITECH) Act, a section of the American Recovery and Reinvestment Act (ARRA) enacted in February 2009, was to "promote the adoption and meaningful use of health information technology."[98] Included in the HITECH Act was $18 billion in funding as incentives for hospitals and physician practices to become *meaningful users* of electronic medical records. An additional $2 billion was allocated to the Office of the National Coordinator to promote health information exchange and use of personal health information by consumers (patients).[99]Meaningful use criteria certified electronic health record (EHR) technology are being used to improve quality, safety, efficiency, and reduce health disparities; engage patients and family; improve care coordination, and population and public health; and maintain privacy and security of patient health information. Stated goals include "better clinical outcomes, improved population health outcomes, increased transparency and efficiency, empowered individuals, and more robust research data on health systems."[100] Meaningful use criteria are in three stages, focused on data capture and sharing, health information exchange, and improved efficiency and effectiveness of care delivery.

The Healthcare Information and Management Systems Society (HIMSS) has developed an EMR analytics model to measure adoption and functionality.[101] Since passage of the HITECH Act in 2009, the percentage of hospitals with advanced capabilities (Stages 5–7) has increased from 6.1 percent to 70.2 percent, whereas the percentage with basic functionality declined from 35.6 percent to 5.6 percent. In comparison, ambulatory (non-hospital) adoption, inclusive of outpatient clinics, physician practices, urgent care centers and surgical centers, has lagged, with only 35.8 percent having advanced capabilities and 53.1 percent still with basic functionality.

EPIC Systems has emerged as the overall electronic medical record market leader in hospitals and ambulatory healthcare, particularly in large academic centers. Other leaders include Cerner and Medical Information Technology (Meditech) in the hospital segment, and Allscripts, NextGen, GE Healthcare and AthenaHealth in the ambulatory segment. Investment requirements vary and may exceed a few hundred million dollars for large hospitals and/or health systems.

FIGURE 55 | STAGES OF MEANINGFUL USE

STAGE 1 2011 - 2012 Data capture and sharing	STAGE 2 2014 Advance clinical processes	STAGE 3 2016 Improved outcomes
Electronically capturing health information in a standardized format	More rigorous health information exchange (HIE)	Improving quality, safety, and efficiency, leading to improved health outcomes
Using that information to track key clinical conditions	Increased requirements for e-prescribing and incorporating lab results	Decision support for national high-priority conditions
Communicating that information for care coordination processes	Electronic transmission of patient care summaries across multiple settings	Patient access to self-management tools
Initiating the reporting of clinical quality measures and public health information	More patient-controlled data	Access to comprehensive patient data through patient-centered HIE
Using information to engage patients and their families in their care		Improving population health

Source: HealthIT.gov. Policymaking, Regulation, & Strategy. Meaningful Use. www.healthit.gov/policy-researchers-implementers/meaningful-use

FIGURE 56 | INPATIENT AND AMBULATORY EMR ADOPTION, 2016

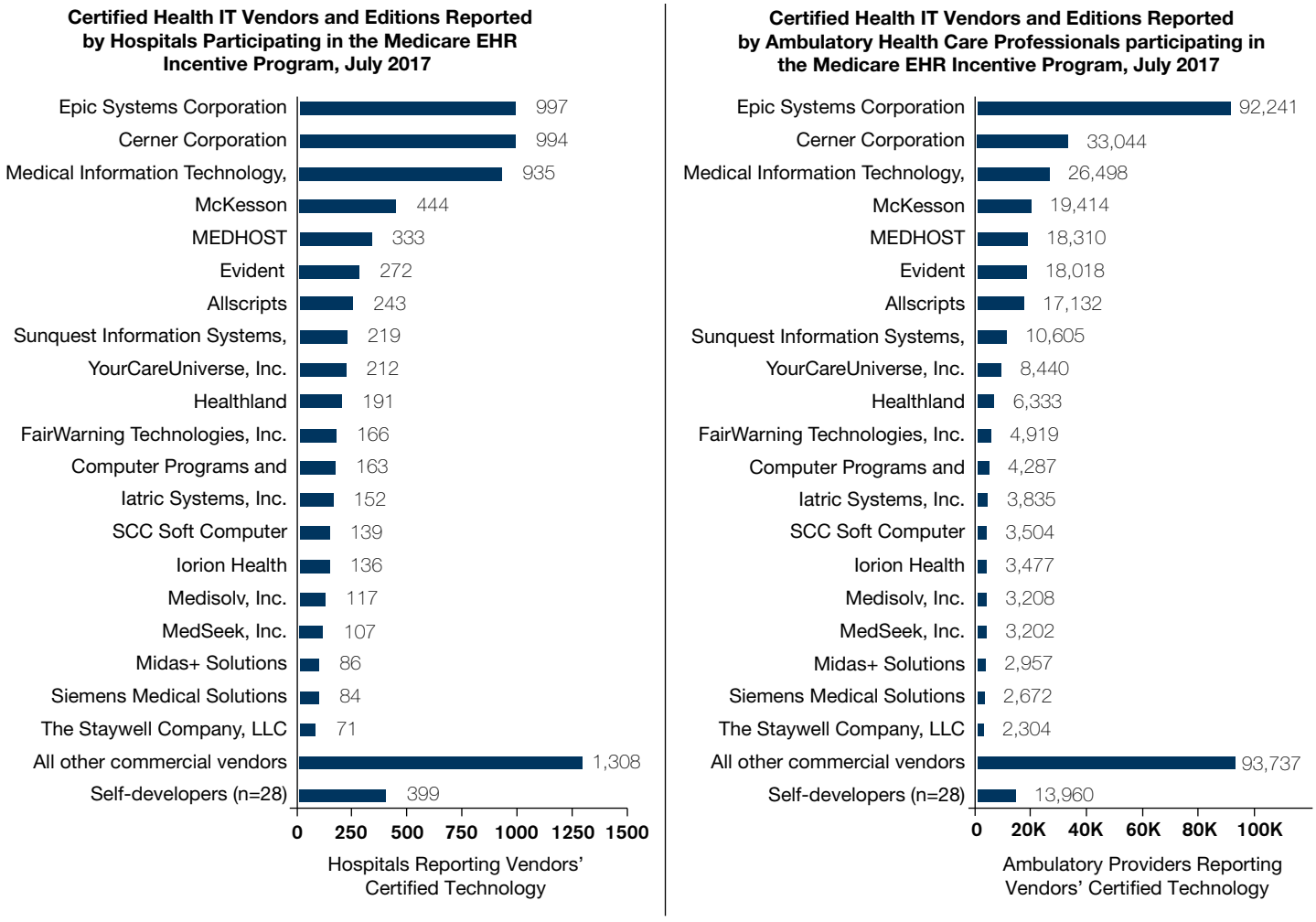
	Stage	Cumulative Capabilities	Inpatient EMR Adoption 2009	Inpatient EMR Adoption 4Q16	Ambulatory EMR Adoption May 2012	Ambulatory EMR Adoption 2016
					Ambulatory	
ADVANCED	7	Complete EMR; CCD (continuity of care document) transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP (data analytics to improve care)	0.7%	4.8%	0.0%	9.9%
ADVANCED	6	Physician documentation (structured templates), full CDSS (clinical decision support system); full R-PACS (Picture Archiving and Communication System)	1.6%	30.5%	1.2%	18.2%
ADVANCED	5	Closed loop medication administration; Full R-PACS	3.8%	34.9%	0.0%	7.7%
MODERATE	4	CPOE (computerized physician order entry), Clinical Decision Support (clinical protocols)	7.4%	10.2%	0.4%	0.8%
MODERATE	3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	50.9%	13.9%	10.9%	10.4%
BASIC	2	CDR (clinical decision rule), Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE (health information exchange) capable	16.9%	2.3%	34.1%	19.2%
BASIC	1	All Three Ancillaries Installed - Lab, Rad, Pharmacy	7.2%	1.4%	5.3%	31.8%
BASIC	0	All Three Ancillaries Not Installed (i.e., paper-based chart)	11.5%	1.9%	48.0%	2.1%

Sources: HIMSS Analytics database, 2011, 2013 and 2017

Selection of an EMR is a complex endeavor and a function of organizational goals (clinical, productivity, reimbursement); price, inclusive of hardware, software, maintenance and upgrade costs, internal interfaces for legacy systems (labs, pharmacy), connection to health information exchange (HIE) and custom reports; implementation support (resources, schedule); data migration strategy; server options and other factors.[102]

The impact of electronic medical records has been below expectations. EMRs have contributed to increased reimbursement but also to a decrease in physician productivity.[103] The decline in physician productivity is mitigated, at least partially, by the delegation of data input to clinical support staff, including medical assistants. Studies have also suggested that EMRs have created more screen time and less patient contact for physicians.[104] Health information exchange within and between healthcare systems has been constrained by limited interoperability among vendors. In addition, population health and other initiatives requiring data extraction and the application of analytics (descriptive and predictive) have also been challenging.

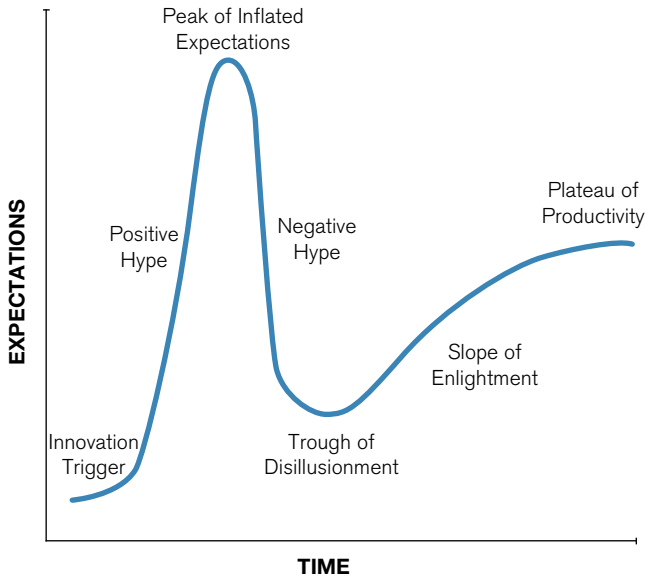
FIGURE 57 | HOSPITAL AND AMBULATORY EMR CERTIFICATION BY VENDOR, JULY 2017



Source: https://dashboard.healthit.gov/quickstats/quickstats.php

FIGURE 58 | EMR BENEFITS, LIMITATIONS AND EXPECTATIONS

BENEFITS	LIMITATIONS
Improved clinical documentation and reimbursement	High capital expenditures and/or maintenance expenditures
Accessibility to multiple providers at the same time; data centralization	Privacy and security concerns; potential for hacking to thousands of records
Patient/caregiver portal enhances engagement ("Open Access", scheduling, user-generated content, timely communications)	Limited interoperability with other providers/ health systems across the continuum of care
Reduced filing and storage costs	Data extraction challenges limit analytics
Receipt of CMS meaningful use incentives	Physician productivity loss
Decrease in data entry errors and enhanced ability to use speech recognition technology; lower transcription costs	



POST-ACUTE CARE DATA INFRASTRUCTURE LAGGING

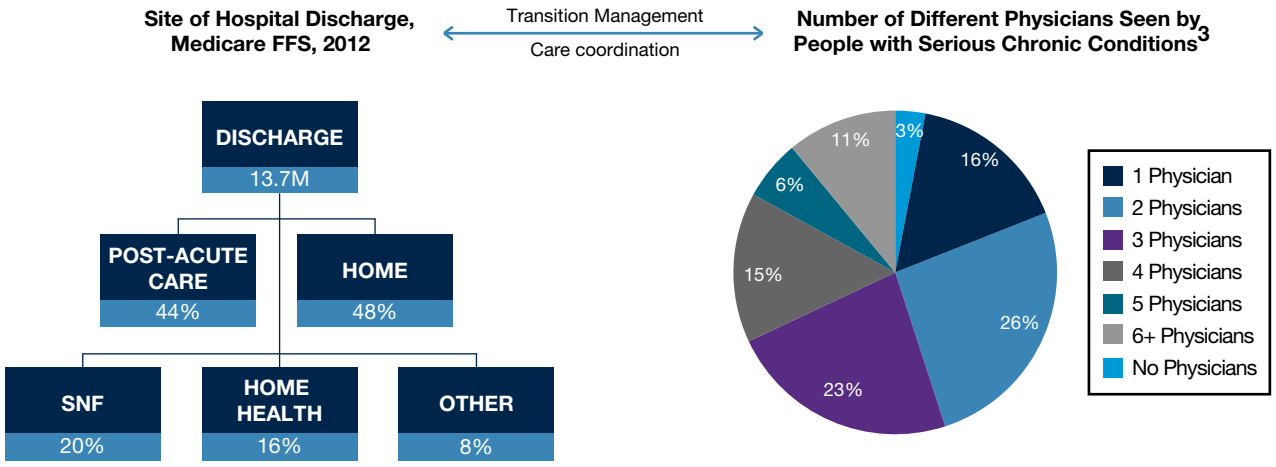
EMR implementation in post-acute care settings such as nursing homes (15,700), home care agencies (12,200), inpatient rehabilitation facilities (1,166) and long-term acute care facilities (412), have lagged even further. Unlike hospitals and physician practices, the HITECH Act did not mandate EMR implementation, nor did it provide financial incentives for post-acute care providers.

In July 2013, the Institute of Medicine published a seminal report entitled "Variation in Healthcare Spending: Target Decision Making, Not Geography" and found that higher spending in Medicare primarily results from "variation in utilization of post-acute care services, and to a lesser extent by variation in the utilization of acute care services."[105] The IOM Committee calculated a Medicare fee-for-service and Medicare Advantage spending variation of 36–50 percent, with post-acute care service providers account for 73 percent of the total variation in spending.

The IOM Committee recommended continued testing of payment reforms that "incentivize the clinical and financial integration of healthcare delivery systems" and encourage (a) care coordination among providers, (b) real-time sharing of data, tracking of service use and health outcomes, (c) distribution of provider payments and (d) risk sharing / management across the care continuum.

Congressional approval of H.R. 4994, the "Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014" mandates the development and implementation of a standardized post-acute care assessment tool that would (1) clarify goals of care, incorporate patient (caregiver) preferences and enhance discharge planning, i.e., placement decisions, (2) facilitate transition

FIGURE 59 | IMPORTANCE OF DATA INTEROPERABILITY ACROSS THE CONTINUUM



Sources: http://www.himss.org/news/gao-releases-report-addressing-post-acute-care-ehr-adoption; Bloomberg School of Public Health – RWJF Chronic Conditions: Making the Case for Ongoing Care, 2010. Gallup Serious Chronic Illness Survey, 2002.

management through interoperable core data transfer and (3) allow for the generation of longitudinal data analytics (e.g., outcomes, cost-effectiveness of alternative settings). The IMPACT Act of 2014 also mandates development of a Medicare payment system according to characteristics of individuals instead of according to the post-acute care setting where the beneficiary is treated.

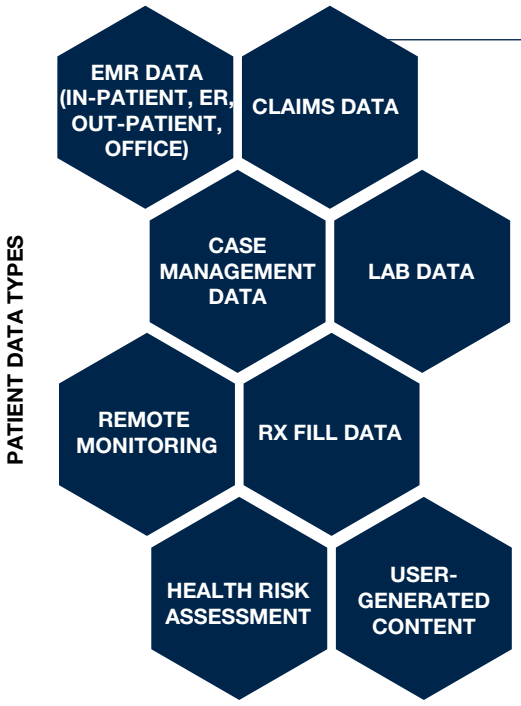
HEALTH INFORMATION EXCHANGE STILL LIMITED

Health information exchange (HIE) across sites of care within and across health systems and stand-alone providers, clinical labs, pharmacies, community organizations, patients and their caregivers is still limited. The list of stakeholders is long, but it is often necessary to share data and information to ensure care coordination and more timely intervention, optimize patient management and avoid duplication of services, medication errors and readmissions. HIMSS has developed a Continuity of Care Maturity Model to demonstrate "the evolution of communication between clinicians in different settings with limited or no electronic communication to an advanced, multi-organizational, knowledge-driven community of care."[106]

FIGURE 60 | HIMSS CONTINUITY OF CARE MATURITY MODEL

STAGE	CUMULATIVE CAPABILITIES
7	Knowledge driven engagement for a dynamic, multi-vendor, multi-organizational interconnected healthcare delivery model
6	Closed loop care coordination across care team members
5	Community wide patient records using applied information with patient engagement focus
4	Care coordination based on actionable data using a semantic interoperable patient record
3	Normalized patient record using structural interoperability
2	Patient centered clinical data using basic system-to-system exchange
1	Basic peer-to-peer data exchange
0	Limited or no e-communication

FIGURE 61 | HEALTH INFORMATION EXCHANGE



- Data integration
- Common definitions

Benchmark data (claims, disease registries, incidence rates, etc.)

- Risk stratification
- Predictive modeling
- Gaps in care
- Workflow rules engine

AUDIENCE	USE AND PLATFORM
Patients/caregivers	• Patient portal • Mobile alerts based on communication preference • 2-way through remote monitoring equipment
Physicians	• Notes in EMR • Alerts • Performance dashboard
Care Managers	• Care management
Customer Service	• Patient CRM
Management	• Reporting and performance dashboards • Analytics tools
Payers	• Quality reporting

Source: Mount Sinai; Modified by A&M

The HIE data architecture may be centralized, where a complete copy of all patient-related information is stored; decentralized, where data is exchanged on an "as needed" basis; or a combination (hybrid) model. Data and information may be accessed directly (e.g., copy of discharge summary or medical history inclusive of medications) or via query, the latter usually for unplanned care (e.g., ED visit).[107] Consumer mediated exchange, formerly known as a personal health record, has not met earlier expectations with use still somewhat limited. Patient consent is required on either an explicit (opt-in) or implicit (opt-out) basis.

The promise of regional health information organizations (RHIOs) focused on a specific geographic area also remains unfulfilled, though progress is being made on a selective basis. Hixny, the NY State Capital District and Northern New York RHIO, provides real-time access to specific data — demographics, problem lists, diagnosis, medications, allergies, lab results, discharge and office visit summaries, ED reports, image studies, etc. — from 719 participating entities, including hospitals, physician groups, payers and others. Consent for participation has been obtained from more than 1 million patients; records are accessed more than 150,000 times per month.[108]

Clinical, operational and financial data challenges are many and include antiquated technology and legacy systems, data fragmentation, disconnected systems and enterprise warehouse deficiencies. Recent implementation challenges associated with electronic medical records have preoccupied IT departments. Despite their promise, many population health and other emerging applications have not met expectations. A number of health systems are beginning to separate the informatics (analytics) staff and responsibilities from the IT personnel, though with recognition that close collaboration is necessary to optimize functionality.

"BIG DATA" IS A MISNOMER. IT'S ABOUT ACTIONABLE INSIGHTS.

The "big data" revolution has resulted in the identification and aggregation of data from disparate sources such as the electronic medical record (EMR), materials management information systems (MMIS), operating room information systems (ORIS), clinical information systems (CIS), laboratory information systems (LIS),

FIGURE 62 | TECHNOLOGY, DATA AND ANALYTICS CHALLENGES

human resources information systems (HRIS), financial systems, the charge master (CDM) and elsewhere to facilitate decision-making. This has led to improved data management and reporting. But the reporting of data is far different than the generation of insights that enable improved decision-making, i.e., actions that lead to measurable progress.

The Institute of Health Improvement (IHI) framework for operational excellence, known as the Triple Aim, is focused on improving the health of the population, the experience of care, and on reducing the per capita costs of care.[109] Data analysis and the use of advanced analytics are essential to its attainment. Transformative, insights-driven approaches to care delivery, risk management, physician alignment and patient engagement are required.

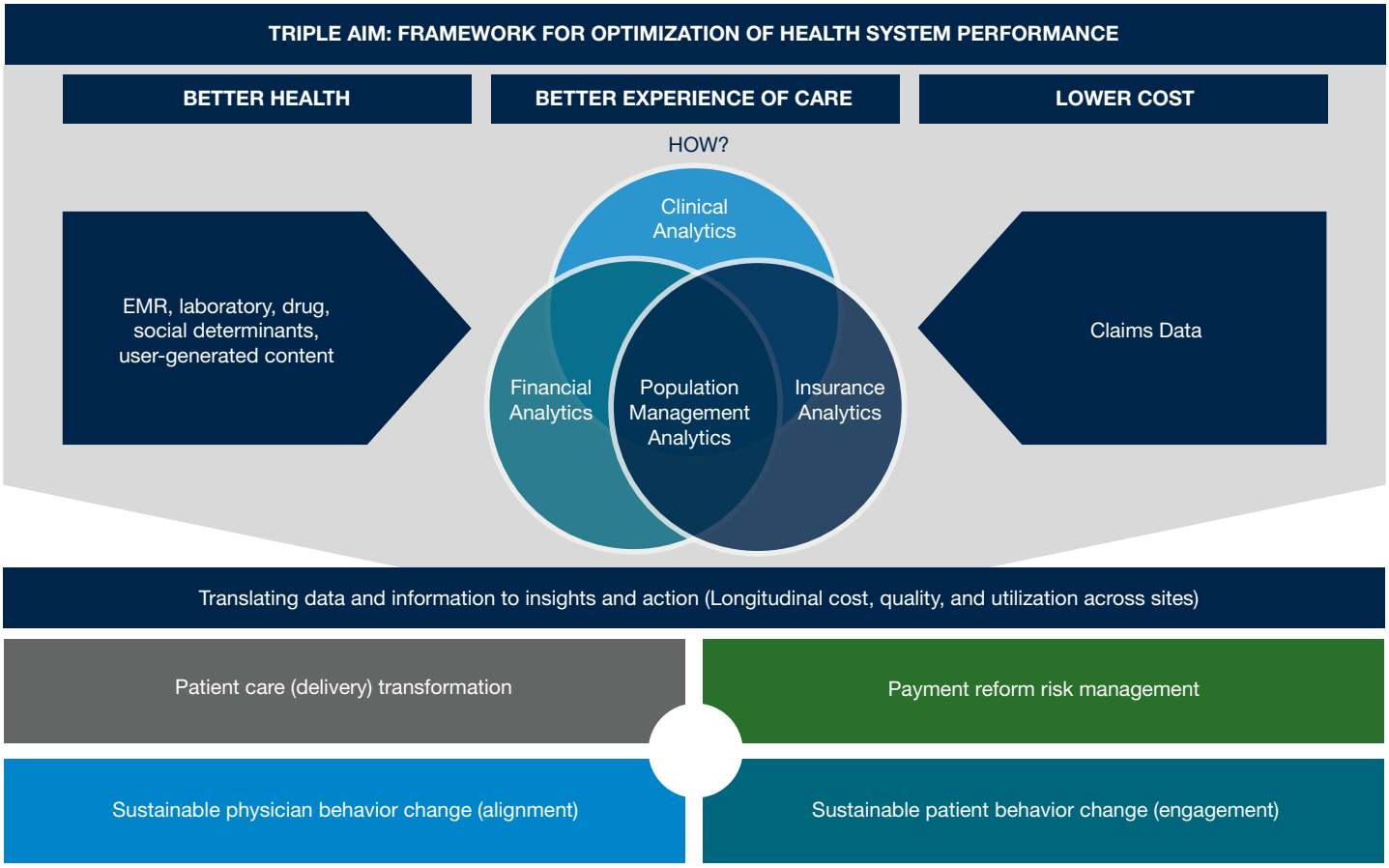
FIGURE 63 | ACTIONABLE INSIGHTS AS THE "BIG DATA" DELIVERABLE

BUSINESS PROBLEM → **COMPLETE ANALYTICAL SOLUTION** → **ACTIONABLE INSIGHTS**

DATA MANAGEMENT	REPORTING AND MIS	DATA ANALYTICS	ADVANCED ANALYTICS
Gathering	**Descriptive**	**Inquisitive**	**Predictive**
• Extraction, transformation and load • Data cleaning to remove errors • Building and maintaining data mart • Data integration and transformation	• Transition existing reports • Create standard and adhoc reports • Automating MIS reports • Set interactive dashboards • Prepare executive summary by consolidating multiple reports	• Rigorous analysis of data to identify underlying patterns in the data • Trend analysis • Segmentation analysis • Validate hypothesis based on result of data analysis • Deep dive analysis and diagnostics to support data driven decision making	• Development of viable statistical / mathematical modeling • Validate and refine the model • Tracking the model • Forecast

Source: http://www.cross-tab.com/data-mining-and-big-data

FIGURE 64 | ANALYTIC FRAMEWORK FOR HEALTHCARE TRANSFORMATION

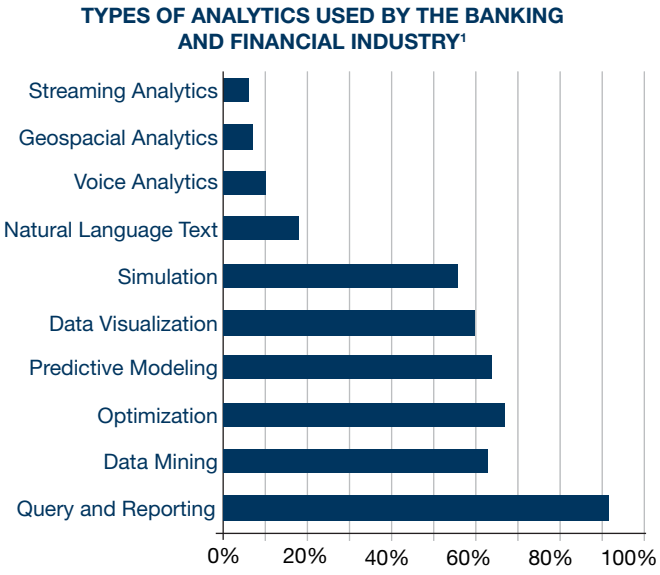


Analytics can be descriptive (historical insights – What has happened?), predictive (of future outcomes – What can happen?) and prescriptive (Assessing a number of possible outcomes based on alternative actions (scenarios) - What should we do?).[110] The goal is to generate actionable insights that enable improved decision-making across all levels of the organization. Analytics is a complex field in which the healthcare industry remains a laggard relative to financial services and other industries.

Data can be structured or unstructured. Structured data can easily be "entered, stored, queried and analyzed" based on the definition of specific fields (e.g., currency, alphabetic, numeric) and data restrictions (e.g., number of characters).[111] Relational databases, based on structured query language (SQL) and spreadsheets are often used for structured data. Unfortunately, the vast majority of healthcare data is unstructured, i.e., not easily placed into "boxes."

Unstructured data includes text, images, video and audio from a variety of sources, including electronic medical records (e.g., progress notes), discharge summaries, radiology reports, nurse notes, dictations and transcriptions, presentations, emails and other sources. Most people prefer unstructured data for their communications due to limited constraints and the potential for the use of rich data (e.g., video) that enhances one's experience. The majority of providers remain unsure regarding the use and integration of unstructured data. Technologies are being developed to "capture unstructured data and convert it into formats that are easily searchable, transmittable, redactable (when necessary), and secure."[112]

FIGURE 65 | TYPES OF ANALYTICS



Streaming Analytics	Allowing organizations to set up real-time analytics computations on data streaming from applications, social media, sensors, devices, websites and more.
Geospatial analytics	The gathering, display and manipulation of imagery, GPS, satellite photography and historical data, described explicitly in terms of geographic coordinates.
Voice analytics	Study vocal elements such as syllable emphasis, tone, pitch and tempo to analyze speaker mood and behaviors.
Natural language processing	Linguistic analysis that essentially helps a machine "read" text using a variety of methodologies to decipher the ambiguities in human language.
Text (data) mining	Extraction of key concepts and themes from text (data), while uncovering hidden relationships and trends.
Predictive modeling	A process that uses data mining and probability (statistics) to forecast outcomes. Each model is made up of a number of predictors, which are variables that are likely to influence future results.
Optimization	Is more than cause and effect; involves finding an alternative with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones.

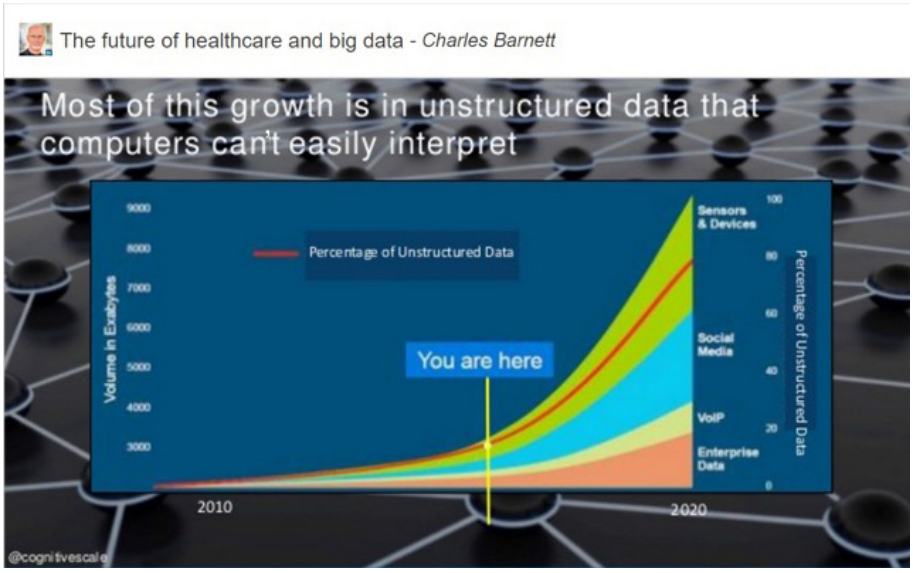
Sources: [1]IBM Institute for Business Value and Said Buisness School at Oxford University, 2012; 2https://rankminer.com/voice-analytics-vs-speech-analytics-difference/; http://whatis.techtarget.com/definition/geospatial-analysis; http://www.expertsystem.com/natural-language-processing-and-text-mining/; https://www.ibm.com/support/knowledgecenter/en/SS3RA7_18.1.0/ta_guide_ddita/textmining/shared_entities/tm_intro_tm_defined.html; http://searchdatamanagement.techtarget.com/definition/predictive-modeling

FIGURE 66 | 75–80% OF HEALTHCARE DATA IS UNSTRUCTURED

"Unstructured data is the information that typically requires a human touch to read, capture and interpret properly. It includes machine-written and handwritten information on unstructured paper forms, audio voice dictations, email messages and attachments, [video; e.g., ultrasound] and typed transcriptions--to name a few.

In regard to documents used in healthcare, the Health Story Project estimates that some 1.2 billion clinical documents are produced in the U.S. each year, and about 60 percent of these contain valuable patient-care information "trapped" in an unstructured format."[2]

By the year 2020, the amount of data will double every 73 days[3]



https://www.slideshare.net/CharlesBarnett3/the-future-of-healthcare-and-big-data; [2]Unstructured Data in Electronic Health Record Systems: Challenges and Solutions; Datamark Solutions, January 10, 2017 http://insights.datamark.net/white-papers/unstructured-data-in-electronic-health-record-systems-challenges-and-solutions; [3] Cognitive Scale Forms Healthcare Group and Appoints President [Charles Barnett]

FIGURE 67 | BENEFITS OF COMPREHENSIVE DATA (EMR, CLAIMS)

	EMRS	CLAIMS
ADVANTAGES ▪ Claims data particularly relevant to in-network and out-of-network spending and resource utilization at the aggregate level; i.e., population health ▪ EMR data granularity and real-time applications facilitates patient management	ADVANTAGES ▪ Extensive data and results capture: history, physical, lab results, radiology and pathology reports, progress notes, etc. ▪ Includes problem list inclusive of co-morbidities and their relative severity ▪ Facilitates avoidance of medication interactions and adverse events; and medication reconciliation ▪ Real-time data inclusive of recent history to assess progression ▪ Measurement of quality and productivity metrics Disadvantages ▪ Not standardized across vendors thereby limiting data exchange, integration, sharing and retrieval	ADVANTAGES ▪ Readily available on an annual basis ▪ Standardized capture of financial and resource utilization information ▪ Extends to multiple providers Disadvantages ▪ Retrospective with payment lag does not allow for real-time patient intervention by the provider ▪ Process orientation; e.g., reporting of HgBA1c test not results. Difficult to capture patient complexity or condition severity ▪ Longitudinal data limited by health plan switching ▪ Accuracy and reliability a concern; inaccurate coding not uncommon especially with medical conditions ▪ Specialty drugs captured under medical claims

Unstructured data represents 75–80 percent of healthcare content "locked into" formats such as PDF, Word and Fast Healthcare Interoperability Resources (FHIR) specifications, the latter a standard for exchanging healthcare information electronically. Traditional Natural Language Processing (NLP) is often limited by the inability to provide adequate context (i.e., situation-specific understanding) to healthcare terminology.

Text mining, the next generation of NLP, facilitates the consumption of unstructured data into complex algorithms. It allows for the creation of structured data elements from unstructured data and provides clinical context when tagging unstructured data elements. Text mining leverages traditional medical ontologies such as SNOMED, "a standardized, multilingual vocabulary of clinical terminology that is used by physicians and other health care providers for the electronic exchange of clinical health information," RxNorm, "providing normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software," and LOINC, "a preferred code set for laboratory test names in transactions between health care facilities, laboratories, laboratory testing devices and public health authorities." [113,114,115]

Providers with access to timely electronic medical record data have a competitive advantage over payers. Claims data is retrospective, has a lag of at least three to six weeks, is process rather than outcome oriented (e.g., whether patients have HgBA1c test, rather than focusing on the level of results), and is subject to up-coding to maximize reimbursement. It does, however, capture useful population health, resource utilization and out-of-network (provider) data. EMR data is real-time, quantitative (e.g., actual lab results) and allows clinicians to better manage patients on a timely basis. In an at-risk, value-based environment, process-of-care enhancements, combined with a reduction in provider variation, can result in substantial improvements in efficiency and effectiveness.

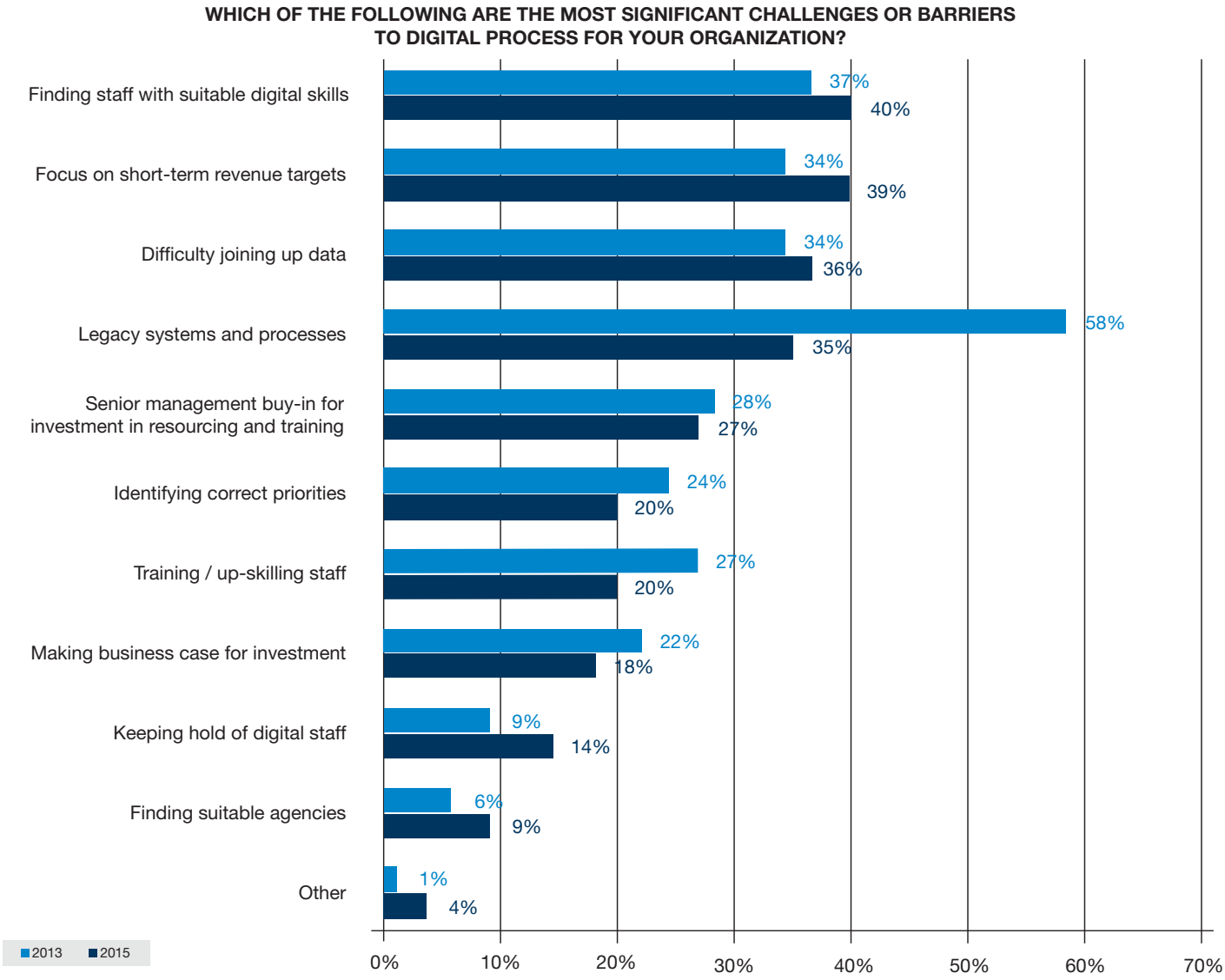
CREATION OF A DATA-DRIVEN ORGANIZATION REQUIRES CHANGE MANAGEMENT

The creation of a successful data-driven organization requires the right people, process and technology. It requires a strategic, multiyear, senior executive effort. Success will require an integrated approach. The impediments to becoming more data-driven have been identified.

In addition, many healthcare professionals are more qualitatively- than quantitatively-oriented. The top 10 reported attributes of a nurse include: communication skills, emotional stability (dealing with traumatic situations), empathy, flexibility, attention to detail, interpersonal skills, physical endurance, problem-solving skills, quick response and respect.[116] Generating insights from a numeric and graphic spreadsheet and/or dashboard cannot always be assumed.

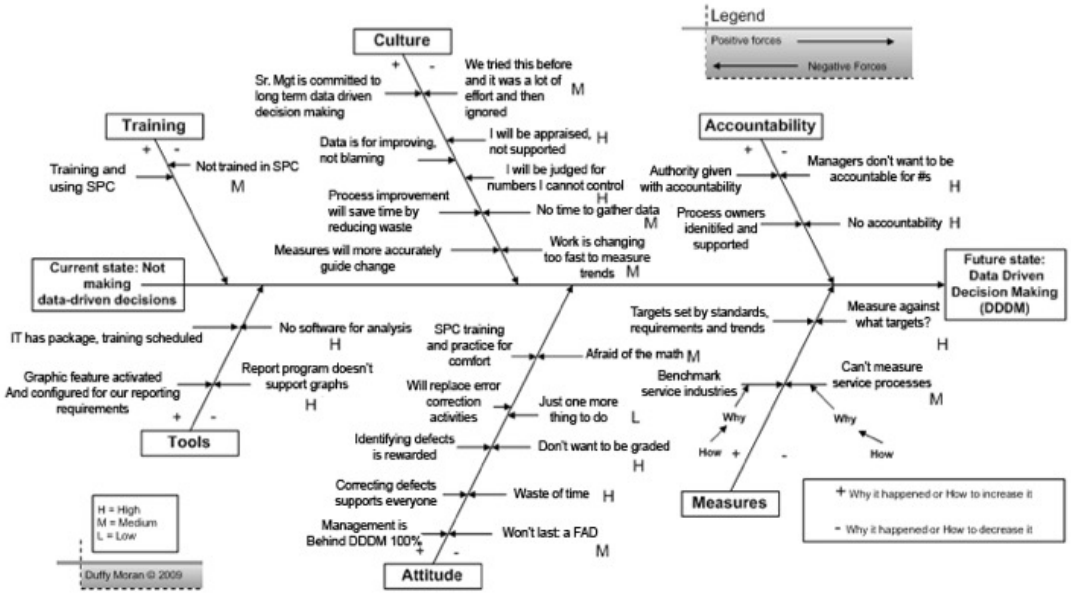
Analysts require a breadth and depth of knowledge and experience, strategic thinking, planning skills, willingness to serve as an advocate and/or adviser, ability to learn a

FIGURE 68 | BARRIERS TO DIGITAL ADOPTION



Ben Davis. Skills shortage the biggest barrier to digital progress (overtaking legacy systems); Nov 30, 2015 https://econsultancy.com/blog/67263-skills-shortage-the-biggest-barrier-to-digital-progress-overtaking-legacy-systems/

FIGURE 69 | OPERATIONAL CHALLENGES FOR THE CREATION OF A DATA-DRIVEN ORGANIZATION



Source: http://www.processexcellencenetwork.com/ShowLargeImageWindow.cfm?image=/article_images/large/ForceEffect_F1.jpg

new domain and be "interested, curious, self-motivated, open-minded, flexible, skeptical, aware of what's worthwhile, methodical, capable of spotting patterns, analytical, and synthetical [organizing disparate information into a cohesive whole]."[117,118] In contrast to nurses, analysts tend to be more quantitative than qualitative.

A convergence of qualitative and quantitative skill sets is required to create a data-driven organization focused on measurement and increased accountability for performance. Change management is required.

In summary, the future of healthcare will require an increased focus on efficiency, effectiveness and the experience of care. An organization driven by analytics — the identification of actionable insights on a timely, if not real-time, basis — will be enabled to improve its decision-making and establish systems for continuous improvement. Strategic opportunities will also be identified. It's about the interaction among people, process and technology.

FIGURE 70 | APPROACH TO BUSINESS TRANSFORMATION

Source: Presentation by S. Ramakrishnan, M. Testani . IBM Center for Learning and Development; March 2, 2011

ENDNOTES

98. HITECH Act Enforcement Interim Final Rule. https://www.hhs.gov/hipaa/for-professionals/special-topics/HITECH-act-enforcement-interim-final-rule/index.html

99. HITECH Answers. https://www.hitechanswers.net/about/about-the-hitech-act-of-2009/

100. EHR Incentives & Certification. https://www.healthit.gov/providers-professionals/meaningful-use-definition-objectives

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AUTHOR'S BIOGRAPHY

David Gruber, MD, MBA, is a Managing Director and the Director of Research with Alvarez & Marsal's Healthcare Industry Group in New York, specializing in strategy, commercial due diligence, analytics, new ventures and health benefits. Dr. Gruber brings 32 years of diversified healthcare experience as a consultant, corporate executive, Wall Street analyst and physician.

Dr. Gruber's A&M publications include: Getting (Much) Closer to the Cost Precipice; Safety Net Hospitals at Risk: Re-thinking the Business Model; Behavioral Health: Key to Chronic Disease Costs; Healthcare: Economic Value Need Not Apply (Yet); and Post-Acute Care: Disruption (and Opportunities) Lurking Beneath the Surface.

Before joining A&M, he spent three years as the Founder of Healthcare Convergence Associates, a consulting firm focused on the convergence of healthcare, technology and the consumer. His initiatives included wireless and tele-health opportunities, chronic obstructive pulmonary disease (COPD) technology assessment, pharmacy benefit management (PBM) diabetes innovation, and retail health and wellness. He was also involved in three healthcare-related information technology (IT) start-ups.

Until 2008, Dr. Gruber was Vice President of Corporate Development and New Ventures with the Johnson & Johnson Consumer Group of Companies. His primary focus was in dermatology / aesthetics, consumer engagement and wireless health across the company. From 1995 to 2004, he worked on Wall Street as a top-ten rated medical supplies and devices analyst at Lehman Brothers, Piper Jaffray and Sanford Bernstein. He was the lead analyst for the initial public offering of Intuitive Surgical (robotics) and Given Imaging, and a merchant banking investment in Therasense.

Prior to entering Wall Street, Dr. Gruber was Vice President of Planning and Business Development for the $1.6 billion healthcare group at Bristol-Myers that included Zimmer, ConvaTec, Linvatec and Xomed-Treace. While at Bristol-Myers, he represented the company with the Health Industry Manufacturing Association (HIMA) as it deliberated the merits of Hillary Clinton's healthcare reform proposals.

Dr. Gruber has recently appeared on NPR and C-Span; was quoted in the Washington Post, Los Angeles Times, The Deal, Healthcare Finance News, Managed Care Executive, Managed Care Outlook, Becker's Hospital Review and Inside Health Policy; and was published in the Journal of Diabetes Science & Technology, Turnaround Management Association Newsletter of Corporate Renewal and American Bankruptcy Institute Journal.

Dr. Gruber is a magna cum laude graduate of a six-year BS-MD program, having earned a bachelor's degree from the Sophie Davis School of Biomedical Education, CCNY in 1981 and a medical degree from the Mt. Sinai School of Medicine in 1983. He also has an MBA from Columbia University and was a Kellogg Foundation National Fellow. Dr. Gruber is currently a Senior Fellow, Healthcare Innovation and Technology Lab (HITLAB) at Columbia Presbyterian. He is a re-elected Trustee to the Teaneck Board of Education.

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