# Healthcare Analytics:

## 4 Trends to Watch in 2019

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# Introduction

For over 30 years, healthcare providers have delivered services based on the fee-for-service model. They treat patients, discharge them, and bill them for the services delivered via health insurance payers as intermediaries, with little accountability for the health and well-being of the patient. Because of the requirements of the Affordable Care Act (ACA), many providers are now transforming into Accountable Care Organizations (ACOs), triggering a fundamental shift of the fee-for-service model into a pay-for-performance (P4P) model.

This transformation demands a fundamental evolution of provider business strategy. Providers will need to deliver the highest quality of healthcare and safety for their patients at the lowest possible cost—while ensuring that patients are not re-admitted for the same diseases or disorders that they were treated for in the first place. Providers with poor P4P metrics—including 30-day re-admission rates—invite fines and penalties that negatively impact reputation, revenues, and profits.

Healthcare analytics play a key role in how providers are implementing P4P. Delivering meaningful, relevant, role-based, accurate, reliable, and actionable insights that align with the real-world concerns of healthcare executives, line-of-business (LOB) leaders, physicians, clinicians, nurses, or analysts is critical for timely decisions that will favorably impact patient outcomes, quality, safety, and the cost of care delivery, while assuring high employee productivity and morale.

Here are some of the key analytics trends in healthcare that are expected to drive innovation and value for providers, physicians, and patients.

# Trend 1

## Actionable analytics put data in context

Data workers want and need their data and actions in the same place. Instead of performing analysis in one silo and taking action in another, data workers should be able to stay in the context of their business processes and workflows. Business intelligence platforms are bridging the gap by merging data with core business operations, workflows, and integrating mobile analytics, embedded analytics, dashboard extensions (also known as add-ins), and APIs. As a result, analytics are expediting the decision-making process for both technical and non-technical roles—and data workers are able to analyze data and take action after finding an insight—all in the same place.

At the Massachusetts General Hospital (Mass General), clinical leaders faced a complex challenge: in the midst of an Epic implementation that was running over time and over budget, they also needed to reduce hospital acquired conditions (HACs). They focused their efforts on reducing CAUTI (catheter acquired urinary tract infection). Executives, clinicians, physicians, and nurses were given access to mobile, role-based dashboards providing a 360-degree view of performance against targets, gaps in performance by hospital and department, and a granular drill down to pinpoint when and where these infections were occurring, enabling them to fix these gaps, lower HACs, and avoid penalties.

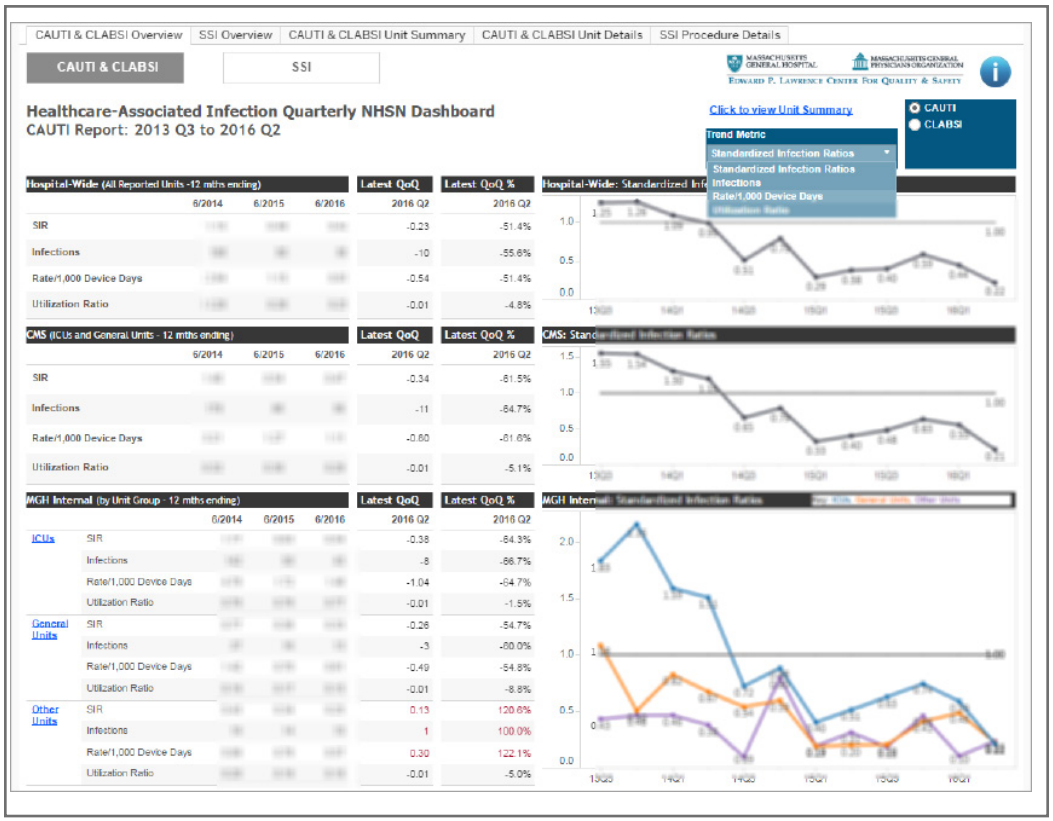



**Figure 1** Hospital acquired infection (HAI) dashboard at Mass General showing trends in improvement of CAUTI (catheter acquired urinary tract infection) over time.

Mass General has achieved remarkable results with actionable analytics in context. They have reduced hospital acquired infections (HAIs)—specifically CAUTI—by 85% within a year, while saving nearly $13 MM in compliance-related penalties over a three-year period. Since implementing self-service visual analytics, the hospital has reduced their ad hoc reporting by 95%, and productivity and morale has improved for the analytics staff.

**Watch this webinar and learn more about data analytics at Massachussetts General Hospital.**

# Trend 2

## Data storytelling is the new language of business

However much you automate, however big your dataset, however clever your calculations, if you can't communicate your findings to others, you can't make an impact with your analysis.

This is why data visualization is so powerful. Data visualization is a language—and it's becoming standard for analysts to know how to convey information to decision makers in a way that is actionable and easy to understand. And data storytelling is the art and the science of visualizing data and sharing the steps that lead to discovering data insights.

Data storytelling is a critical element of modern analytics process. And a changing workplace culture, where analytics reigns supreme, is constantly refining the definition of data storytelling. As organizations create cultures of analytics, analysts' data storytelling methods are more about nurturing a conversation around the data and less about arguing for a singular conclusion. These data-first organizations are also fostering data literacy efforts aimed at teaching people to truly understand the data and to be participants in the analytical conversation—from the moment of discovery to the resulting business decision.

Data storytelling will continue to gain ubiquity as more organizations create work flows and teams focused on analytical collaboration. Cross-team collaboration is shaping how organizations use data to engage, inform, and test ideas—and defining what it means to tell a story with data. And as more people understand how to interpret data and explain their analytical processes, it amplifies the potential for positive business impact.

Data-driven physicians, clinicians, and nurses are using flexible, easy to learn and use self-service visual analytics tools to significantly improve decision making at the point-of-care (POC). For example, emergency department physicians at Texas Children's Hospital, frustrated with the limitations of legacy BI tools are 'taking matters into their own hands' and leveraging self-service visual analytics to monitor sedation in newborn infants with cardiovascular birth defects, ensuring accurate dosage and superior outcomes, to identifying millions of dollars in sub-optimal revenue leakage that the CFO's office did not detect.

Dr. Barbara-Jo Achuff, an attending physician in the pediatric cardiovascular intensive care unit (CVICU) at Texas Children's Hospital, oversees critical care for infants born with cardiovascular birth defects faced a daunting challenge. She suspected that the sedation dosage being administered to these infants was not accurate or consistent, presenting life threatening risks to them. Dr. Achuff purchased a copy of Tableau Desktop with her own credit card and analyzed data from Excel spreadsheets and the hospital's Epic Electronic Health Record (EHR) to monitor, measure, and analyze the sedation protocols. Actionable insights from her analysis led to powerful stories for her staff, colleagues, and superiors, reducing the variation in administration of the sedation protocols, improved medication management, and resulting in the following benefits:

- Reduced ICU length of stay (LOS) resulting in improved bed management
- Lower frequency of unplanned events (loss of breathing tubes) translating into improved safety margins
- Reduced cumulative doses of opioids resulting in lower addiction in patients

**Read more about Texas Children's Hospital and its success with data analytics.**

**Watch the video.**

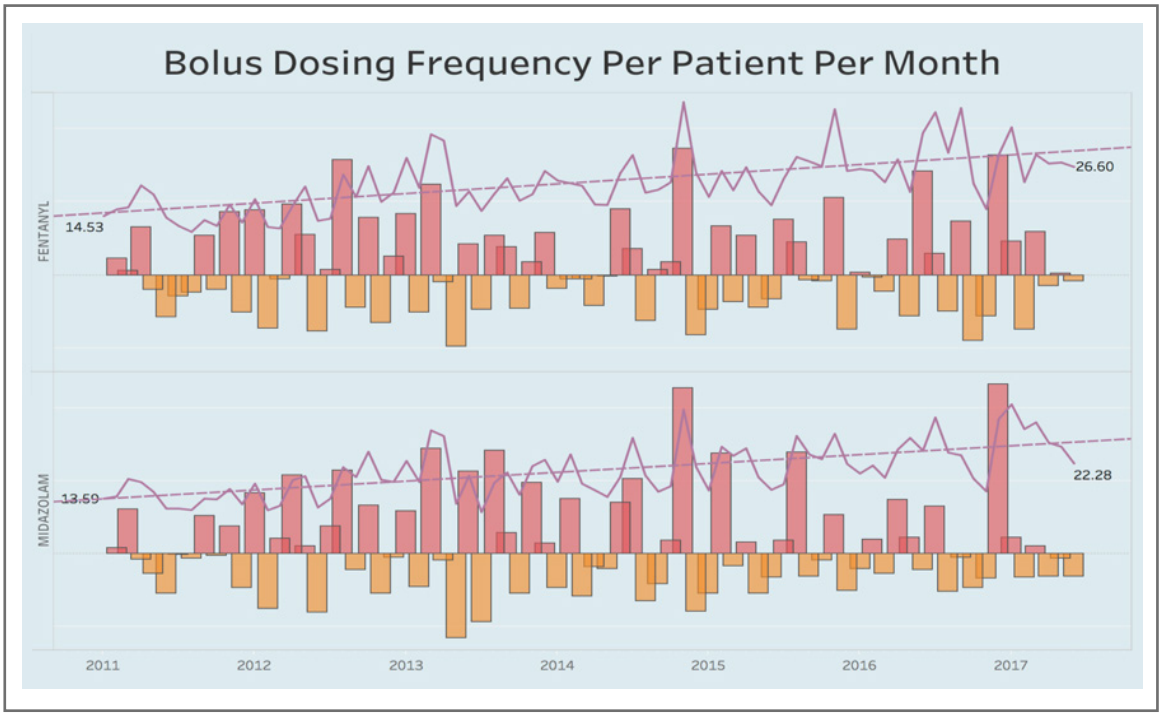



**Figure 2** Analysis of opioid dosing frequency per patient per month helped identify quality issues and associated metrics to be monitored, to improve patient safety and outcomes.

# Trend 3

## Enterprises get smarter about analytics adoption

Business intelligence initiatives often have well-defined start and end dates and it's not uncommon for them to be considered "complete" after they're rolled out to users. But merely providing access to business intelligence solutions isn't the same as adoption. Chief data officers, primarily, are reevaluating how BI adoption plays a part in a strategic shift towards modernization, because true value isn't measured by the solution you deploy, but how your workforce uses the solution to impact the business.

The assumption that everyone is getting value out of a BI platform just because they have access to it can actually inhibit an organization from making real progress with analytics. Instead of focusing on simple adoption metrics, leaders should focus on whether or not data and analytics are changing the way decisions are made throughout the organization.

At Northwell Health, one of the largest healthcare systems in the Northeast U.S., executives wanted to roll out advanced analytics that would enable them to monitor, measure, analyze, and improve the performance of their Accountable Care Organization (ACO) and their value-based purchasing (VBP) initiatives, and ensure superior patient outcomes at a lower cost. They embraced a 'balanced scorecard' to ensure that the entire organization—from senior executives to line level staff—had access and visibility into the key metrics and KPIs that were being monitored and reported to drive ACO performance. Deployment of self-service, role-based visual analytics with the appropriate cascading metrics across organizational silos ensured that executives, line of business (LOB) leaders, clinicians, physicians, nurses, and analysts had the actionable insights needed to shape their behavior in alignment with organizational goals and objectives.

The results of this enterprise-wide analytics deployment were measurable and impactful, and resulted in over **$20 MM** in savings and incremental revenue and performance impact as below:

- Reduced care management admits per 1000 by 24%, and ED admits per 1000 by 20%
- Reduced 30-day re-admissions from 15.8% in 2016 to 14.9% in 2018 through analysis of their CMS STAR 7 measures
- Improved their health home outreach performanace by 15% over 2015 to 2016, and by 8% over 2016 to 2017

- Increased home health outreach operations revenues by 105% over 2015 to 2016 and by 31% over 2016 to 2017
- Enhanced transition care management patient satisfaction from 78% in 2017, to 83.5% in 2018
- Identified over **$20 MM** in value-based purchasing (VBP) opportunities through strategic, insights-driven segmentation of their provider network

**Watch this webinar and learn more about data analytics at Northwell Health.**

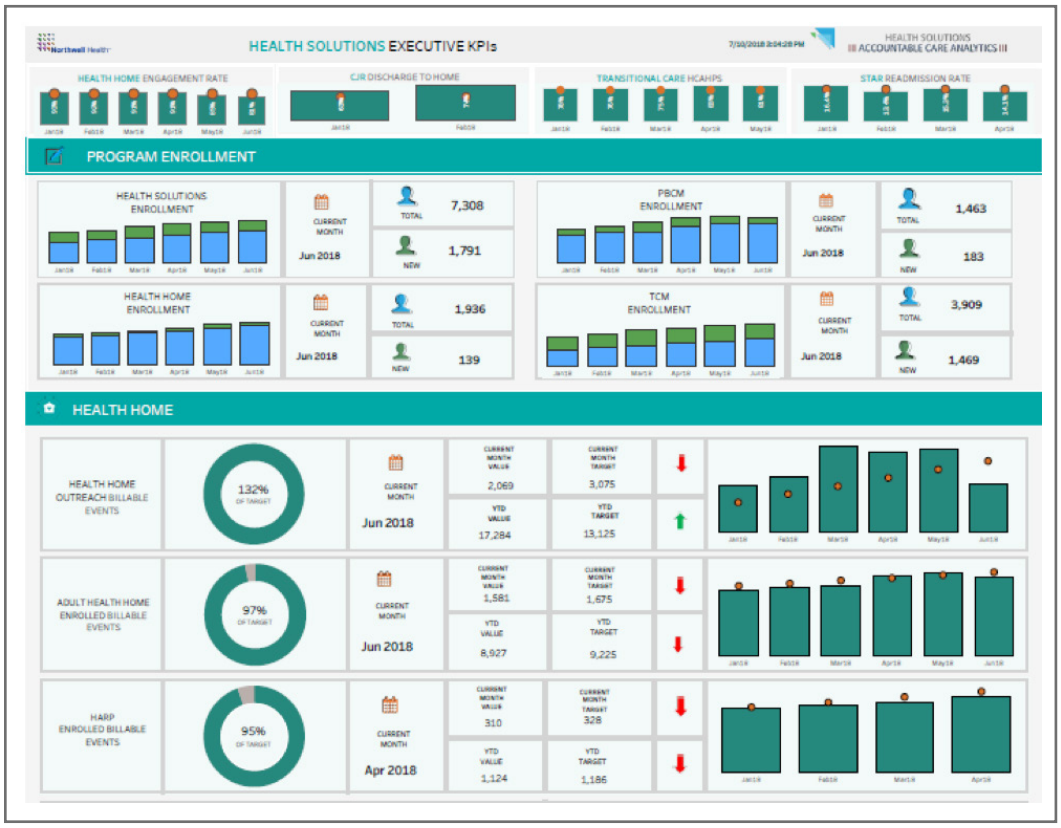



**Figure 3** Analysis of opioid dosing frequency per patient per month helped identify quality issues and associated metrics to be monitored, to improve patient safety and outcomes.

# Trend 4

## Governed data curation bridges the gap between data and business

As data sources become more numerous, diverse, and complex, management is even more critical when deploying modern BI solutions. As more of the workforce uses data to drive decisions, organizations must ensure the accuracy of their data, and govern how it's used in analyses.

Organizations have turned to data curation to address the data management and governance challenges that come with broader data access. Simply stated, data curation is how an organization captures, cleans, defines, and aligns disparate data. Well-curated data creates a bridge between the data and its real-world applications.

Organizations in all industries are already spending millions of dollars on technologies that integrate data definitions with analytical tools that help analyze the data—aiming to remove ambiguity across teams and organizations. In response, data curation tools and processes (like data catalogs and semantic governance) are converging with BI platforms to link data with business context.

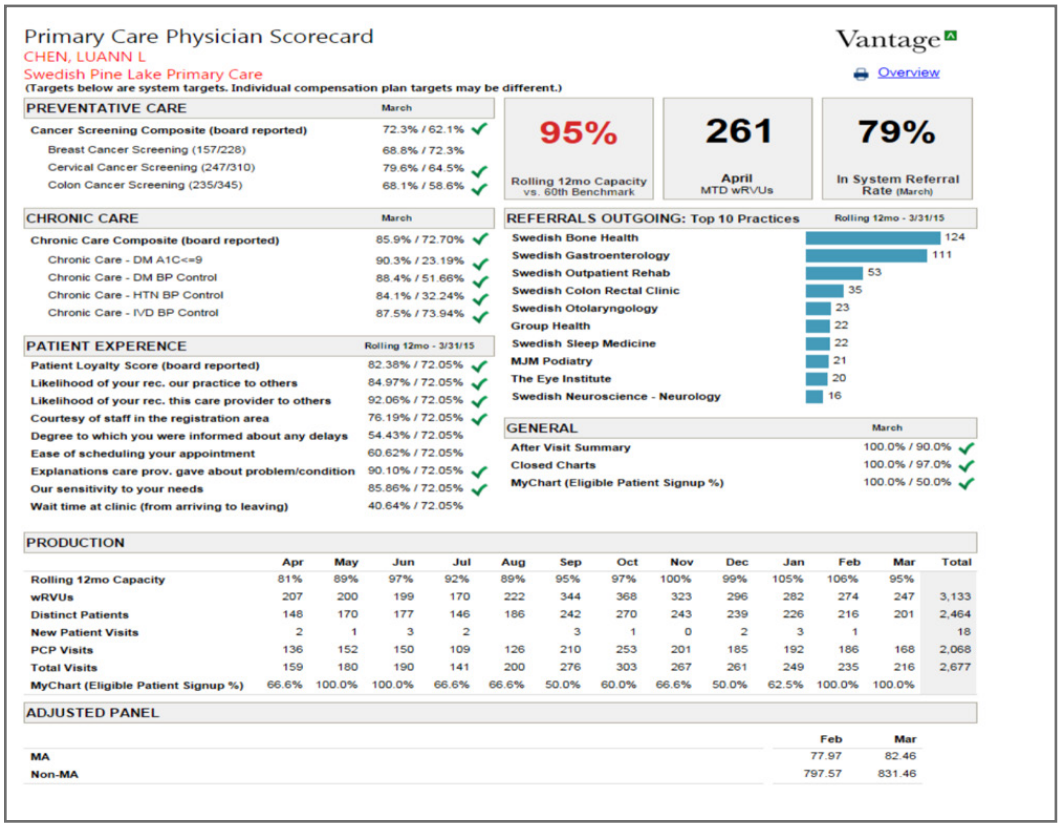
As these technologies and processes continue to converge, data curation and semantics will be foundational to the rest of the analytical experience. More disparate components of the data ecosystem will be unified—like cleansing and downstream analysis—feeding stronger machine-generated recommendations for tables, joins, and data models. Ultimately, advancements in data curation will enable the workforce to move beyond just asking questions of their data during analysis, toward asking questions of their business.

Providence St. Joseph's Health is the third-largest healthcare provider in the U.S.—with 34 hospitals, 475 physician clinics, 22 long-term care facilities, 19 hospices, 693 supportive housing units, 436,000 members, and 76,000 employees. All those people and facilities produced an avalanche of data that was impossible to use properly—until the organization embraced self-service analytics.

Providence St. Joseph's Health built a self-service data discovery, operational reporting, and analytics platform called 'Vantage' that brings together governed and curated data from EPIC, Lawson, Press-Ganey, and other hospital systems to deliver 40 standard reports across 30,000+ users. These standardized reports across financial, operational, supply chain, and clinical functions (including physician scorecards) enable executives to monitor the financial health of the enterprise, operational supply chain efficiencies, and benchmark physician utilization and performance. Of particular significance was their physician scorecard, used to benchmark physician performance based on utilization, quality of care delivery, patient

experience and satisfaction, and other KPIs. Adoption of the platform and these physician scorecards has increased physician productivity by 8% in 12 months, with a measurable decrease in 30-day re-admission rates for PHM. Adopting predictive and prescriptive analytics to augment PHM capabilities is on the horizon.

**Watch this webinar and learn more about data analytics at Providence St. Joseph's Health.**



Primary Care Physician Scorecard

CHEN, LUANN L

Swedish Pine Lake Primary Care

(Targets below are system targets. Individual compensation plan targets may be different.)

Vantage

Overview

**PREVENTATIVE CARE** — March

| | |
|---|---|
| Cancer Screening Composite (board reported) | 72.3% / 62.1% ✓ |
| Breast Cancer Screening (157/228) | 68.8% / 72.3% |
| Cervical Cancer Screening (247/310) | 79.6% / 64.5% ✓ |
| Colon Cancer Screening (235/345) | 68.1% / 58.6% ✓ |

**95%** — Rolling 12mo Capacity vs. 60th Benchmark

**261** — April MTD wRVUs

**79%** — In System Referral Rate (March)

**CHRONIC CARE** — March

| | |
|---|---|
| Chronic Care Composite (board reported) | 85.9% / 72.70% ✓ |
| Chronic Care - DM A1C<=9 | 90.3% / 23.19% ✓ |
| Chronic Care - DM BP Control | 88.4% / 51.66% ✓ |
| Chronic Care - HTN BP Control | 84.1% / 32.24% ✓ |
| Chronic Care - IVD BP Control | 87.5% / 73.94% ✓ |

**REFERRALS OUTGOING: Top 10 Practices** — Rolling 12mo - 3/31/15

| | |
|---|---|
| Swedish Bone Health | 124 |
| Swedish Gastroenterology | 111 |
| Swedish Outpatient Rehab | 53 |
| Swedish Colon Rectal Clinic | 35 |
| Swedish Otolaryngology | 23 |
| Group Health | 22 |
| Swedish Sleep Medicine | 22 |
| MJM Podiatry | 21 |
| The Eye Institute | 20 |
| Swedish Neuroscience - Neurology | 16 |

**PATIENT EXPERENCE** — Rolling 12mo - 3/31/15

| | |
|---|---|
| Patient Loyalty Score (board reported) | 82.38% / 72.05% ✓ |
| Likelihood of your rec. our practice to others | 84.97% / 72.05% ✓ |
| Likelihood of your rec. this care provider to others | 92.06% / 72.05% ✓ |
| Courtesy of staff in the registration area | 76.19% / 72.05% ✓ |
| Degree to which you were informed about any delays | 54.43% / 72.05% |
| Ease of scheduling your appointment | 60.62% / 72.05% |
| Explanations care prov. gave about problem/condition | 90.10% / 72.05% ✓ |
| Our sensitivity to your needs | 85.86% / 72.05% ✓ |
| Wait time at clinic (from arriving to leaving) | 40.64% / 72.05% |

**GENERAL** — March

| | |
|---|---|
| After Visit Summary | 100.0% / 90.0% ✓ |
| Closed Charts | 100.0% / 97.0% ✓ |
| MyChart (Eligible Patient Signup %) | 100.0% / 50.0% ✓ |

**PRODUCTION**

| | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rolling 12mo Capacity | 81% | 89% | 97% | 92% | 89% | 95% | 97% | 100% | 99% | 105% | 106% | 95% | |
| wRVUs | 207 | 200 | 199 | 170 | 222 | 344 | 368 | 323 | 296 | 282 | 274 | 247 | 3,133 |
| Distinct Patients | 148 | 170 | 177 | 146 | 186 | 242 | 270 | 243 | 239 | 226 | 216 | 201 | 2,464 |
| New Patient Visits | 2 | 1 | 3 | 2 | | 3 | 1 | 0 | 2 | 3 | 1 | | 18 |
| PCP Visits | 136 | 152 | 150 | 109 | 126 | 210 | 253 | 201 | 185 | 192 | 186 | 168 | 2,068 |
| Total Visits | 159 | 180 | 190 | 141 | 200 | 276 | 303 | 267 | 261 | 249 | 235 | 216 | 2,677 |
| MyChart (Eligible Patient Signup %) | 66.6% | 100.0% | 100.0% | 66.6% | 66.6% | 50.0% | 60.0% | 66.6% | 50.0% | 62.5% | 100.0% | 100.0% | |

**ADJUSTED PANEL**

| | Feb | Mar |
|---|---|---|
| MA | 77.97 | 82.46 |
| Non-MA | 797.57 | 831.46 |

**Figure 4** The physican scorecard benchmarks performance based on utilization, quality of care delivery, patient experience and satisfaction, and other KPIs.

# Conclusion

Market forces—including evolving regulations, increased consumerism, value-based care, and growing patient financial burden—are forcing healthcare organizations to transform their approach to managing their business processes, from clinical and population health management (PHM), operations, procurement and supply chain management (SCM) to HR productivity, finance, and revenue cycle management (RCM). Increasingly, the healthcare sector is turning to technology to address the challenges of RCM. This includes a combination of software solutions, electronic health records systems, and business intelligence platforms.

Self-service visual analytics from Tableau is the leading enterprise-ready analytics and BI platform for healthcare organizations. Visual analytics from Tableau helps decision makers across the enterprise (executives, line of business leaders, physicians, clinicians, nurses and analysts) understand their data and create actionable insights to lower costs, improve the quality of care and patient outcomes, and drive operational and revenue cycle efficiencies. At the same time, organizations receive tangible payback on their healthcare IT (HIT) investments in weeks and months.

# About the Author

Andy Dé is the senior global industry director for Healthcare and Life Sciences at Tableau Software. In this role, he leads the innovation, thought leadership, go-to-market, partner ecosystem and commercialization strategy, planning and execution for Tableau's solutions targeted at healthcare providers, payers, pharmaceuticals, and medical devices. He has over 20 years of prior enterprise software innovation strategy, solutions portfolio management, and go-to-market strategy, planning and execution leadership experience at GE Healthcare, SAP Health-Sciences and i2.

Andy is passionate about healthcare innovation and authors the health sciences strategy blog and its companion twitter feed (@HITstrategy) with a readership audience across 47 countries, that has been referenced by the Harvard Medical School, the Ohio State University (OSU), the Healthcare Information Management Systems Society (HIMSS), Partners Healthcare, and the Washington Post. He has been extensively quoted and published in leading Healthcare publications like Healthcare IT News, Health Data Management (HDM), Healthcare Informatics, Modern Healthcare, Search Health IT, Fierce Healthcare, Health Management Technology, and Hospitals and Healthcare Networks (HHN). Andy was recently recognized as 'one of the Top 55 Healthcare IT experts and thought leaders on Twitter in 2016-17' by Health Data Management (HDM), and as one of the 2018 HIMSS Social Media Ambassadors (SMAs) by the Healthcare Information Management Systems Society (HIMSS). His professional profile can be accessed at www.andyde.com

# About Tableau

Tableau helps people transform data into actionable insights. On the Tableau platform, it's easy to explore your data, build dashboards, and perform ad hoc analyses in just a few clicks. Healthcare organizations are using Tableau to enable data-driven decisions at scale that can reduce costs, enhance quality, and ultimately improve the patient experience.

Download a free trial and experience the power of Tableau for yourself.

## Relevant Resources

Tableau Healthcare solutions page

Driving Population Health Management with Visual Analytics at Mount Sinai Health

Piedmont Healthcare Improves Care with Proactive Insights

Spreading Visual Analysis throughout Barnes Jewish Hospital

Michigan Medicine Optimizes Workforce with Tableau, Saving 5,000 Analyst Hours in a Year