Five Trends in Healthcare Analytics for 2018

Andy Dé, Sr. Director Healthcare and Life Sciences

Introduction

The healthcare industry in the U.S. is facing a watershed year as numerous attempts to repeal and replace the Affordable Care Act (ACA) have failed. Given the dire need for higher quality care at lower costs, the enablement of patients, population health management (PHM), and operational excellence is more important than ever. It will be no surprise that 2018 reveals a pent up demand for better healthcare IT and analytics that drive higher efficiencies in strategic planning, improved human resources, advancement of clinical quality and safety, better operations and supply chain management (SCM), and progressive finance and revenue cycle management (RCM).

Each year at Tableau, we start a conversation about the data movement and new analytics trends in each industry. Here are our predictions for the trends in healthcare analytics that will add value for healthcare providers, physicians, and patients this year:

1. Artificial Intelligence (AI) and machine learning (ML) enhance analyst efficiencies

2. Analytics will drive the "accountability" in Accountable Care Organizations (ACOs)

3. Healthcare will see a rise in empowered clinician analysts

4. Genomics and cloud analytics will enable and enhance precision medicine

5. Location data and the Internet of Things (IoT) will improve asset efficiencies and patient flow

1. Artificial Intelligence and machine learning enhance analyst efficiencies

The healthcare industry will see the maturity of artificial intelligence (AI), machine learning (ML), and predictive analytics in specific business use-cases like population health stratification, care coordination, and risk-based wellness and disease management. This maturation will complement existing descriptive analytics models and frameworks already being applied in healthcare infrastructures.

With the additional depth and visibility added into population health data, physicians, nurses and care coordinators will be able to better monitor and measure risks associated with patients, and appropriately tailor their treatments.

Things like care co-ordination, patient education protocols, and other processes will start to deliver dividends in patient outcomes. Population risk stratification leveraging predictive analytics will enable deeper understanding of the risks and financial implications associated with treatment protocols and decisions on a per-patient basis.

The Analytics Center of Excellence (COE) at the Cleveland Clinic is already using these advanced technologies to build a patient risk identification solution. By integrating patient data from their Epic electronic health record (EHR), revenue cycle management, and other healthcare IT systems, they're able to create a predictive analytics model with R unified in Tableau. This model allows the Cleveland Clinic to stratify their attributed patient population of 54,000 and identify the 1,000+ multi-morbid patients most at risk of 30 day re-admissions.

Learn More about using SQL, R and predictive analytics with Tableau.
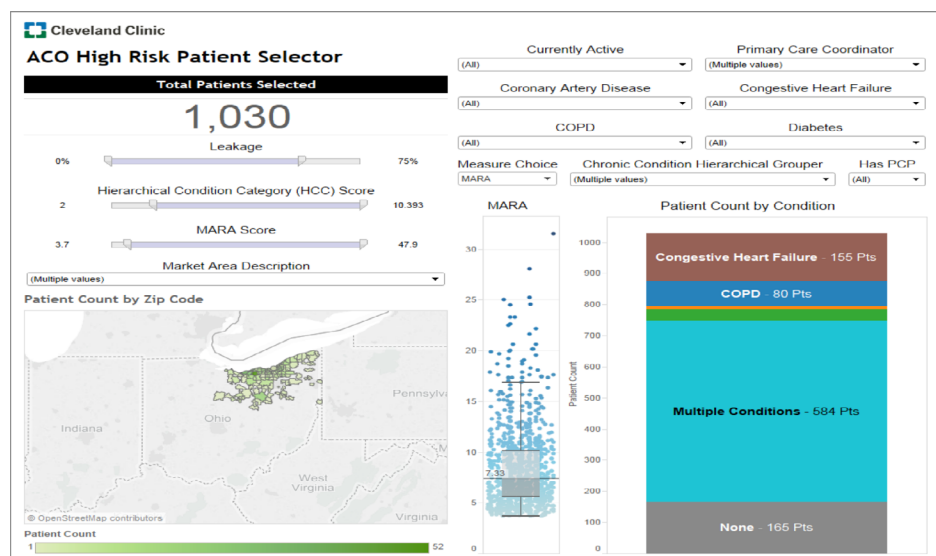
Here is an example of the Cleveland Clinic's high risk patient selector dashboard, used for population risk stratification.

2. Analytics will drive the "accountability" in Accountable Care Organizations (ACOs)
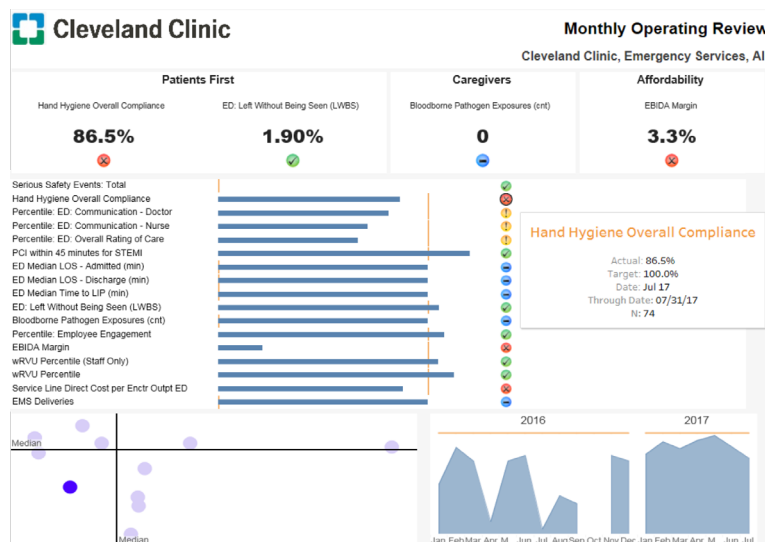
Historically, the lack of analytics platforms that can aggregate data from multiple disconnected healthcare IT (HIT) systems has been the primary barrier to enabling accurate, real-time visibility into monitoring, measuring, analyzing performance and accountability.

In 2018, analytics that combine data from any source will further enable CXOs to embrace strategic management frameworks to drive real accountability in ACOs. This year healthcare will see a rise in self-service, visual dashboards that will power balanced scorecards, which enables the cascading of metrics across the enterprise, improving transparency and collaboration. The newfound transparency delivered from interactive dashboards with aggregated data ultimately drives improved organizational behavior and incentives aligned performance.

In the clinical context, balanced scorecards can measure something like physician performance— utilization, patient satisfaction, etc.— can now be monitored, measured and analyzed with dashboards that show physician performance, which spurs healthy competition and measurable improvements in productivity.

The Cleveland Clinic is using balanced scorecards in executive management systems to align the enterprise around its clinical priorities. Using metrics and KPIs that are cascaded top-down, the Cleveland Clinic sees greater transparency and accountability to shared goals around specific business and clinical outcomes. For example, their Emergency Services Department has seen a 25% increase in call-back rates, while simultaneously lowering time-to-value by 50% against their legacy tools.

This dashboard is an example of a balanced scorecard the Cleveland Clinic uses to communicate metrics and KPIs across the enterprise and improve accountability.

## 3. Healthcare will see a rise in empowered clinician analysts

This year, healthcare will see a rise in physicians, clinicians, nurses armed with easy-to-use, self-service analytics. With more healthcare workers asking and answering their own questions, the industry will start to see a paradigm shift in data-driven decision-making right at the point-of-care (POC).

For example, emergency department physicians at the Texas Children's hospital are using self-service analytics to monitor sedation in newly born infants with cardiovascular birth defects. Having immediate access to real-time analysis and insights ensures more accurate medication dosage and mitigates risks for these newly born patients and their parents.

Learn more about how Texas Children's hospital is empowering physicians and improving infant care with self-service analytics.

Dr. Barbara-Jo Achuff, an emergency department physician at Texas Children's Hospital, oversees critical care for infants born with cardiovascular birth defects. When she suspected that the sedation dosage being administered to these infants was not accurate or consistent, and presenting life threatening risks in her patients, she turned to self-service analytics to change course. Dr. Achuff quickly combined data from the Epic Electronic Health Record (EHR) and excel spreadsheets to monitor, measure, and analyze sedation protocols. Her quick analysis revealed insights that reduced the variation in administration of the sedation protocols, and also resulted 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
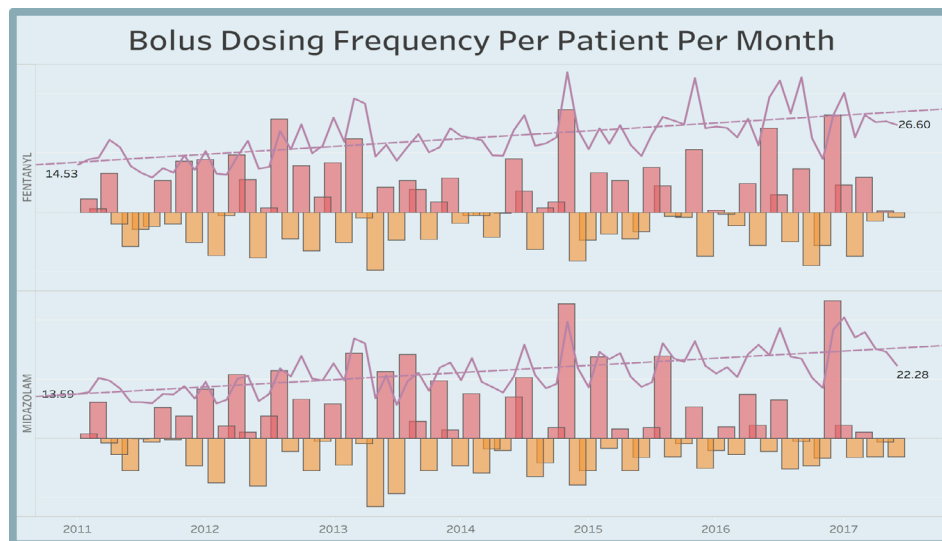
Here is an example of a dashboard used for the analysis of opioid dosing frequency per patient, per month, to help identify quality issues and improve patient safety and outcomes.

4. Genomics and cloud analytics enables and enhances precision medicine

Precision medicine is a promising approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. The new ability to capture genomics data from newborn infants and their parents, store it cost-effectively in the cloud, and then analyze it for variances will power precision medicine in 2018.

Inova Translational Medicine Institute (ITMI) is capturing genomic profiles of newborn infants and their parents at the time of birth. With data compiled around places of birth, genetic diversity, demographics, and clinical variables for cohorts of interest, the entirely of the genomic data is archived in the cloud via Amazon Web Services (AWS).

Visual Analytics of these genomic profiles is helping identify specific bio markers and variants to proactively detect and manage life threatening disorders and chronic diseases in these infants. Armed with insights, doctors can personalize treatment protocols faster, enabling better patient outcomes and reduced infant and child mortality. Scaled precision medicine over time will have far reaching positive impact for saving lives, bending cost curves, and lowering cost of care.

> ❝ To fully realize genomics in healthcare, the right technology is needed to effectively leverage and use genomic data. One hospital is taking steps toward that goal."
> - BY KRISTIN LEE, NEWS WRITER

Learn more about the findings from the 3,500 families enrolled in ITMI's genomic tracking and precision medicine.

These dashboards represent generic variation analysis for newborn infants at the Inova Translational Medicine Institute (ITMI), as basis for precision medicine and personalized medical care

5. Location data and the Internet of Things (IoT) improves asset efficiencies and patient flow

The healthcare industry is one of the earliest adopters to utilize location data. This year, we'll see more healthcare companies harness Real-time Location Systems (RTLS) from companies like Stanley Healthcare, to help track and trace expensive assets within the four walls of the hospital. Location and the Internet of Things (IoT) data can also help monitor nurse and clinician hand hygiene, and even prevent newborn children from being stolen from hospital beds.

Florida Hospital Celebration Health is using RTLS tags and sensors to provide and track improvements in inventory, security, and safety products for their organization. Like GPS, RTLS is location tracking technology, but with greater precision for tracking movements within a building rather than across the globe. The data gathered from these tags and sensors are analyzed in real-time with visual dashboards that enable healthcare workers to take faster action.

Nurses, support staff, and a few cooperative doctors also wear location tags that attach to their name badges, to broadcasting an ultrasound signal, which is then tracked through sensors in the ceiling. This technology allows live tracking of staff on duty, which can be analyzed in a heat map and show the areas of greatest activity. Location and IoT analysis also makes it possible to pinpoint the location of the most demanding patients and identify the tasks that may have been distributed inefficiently across the workforce.

Learn more about how Florida Hospital Celebration health is improving care with location data.
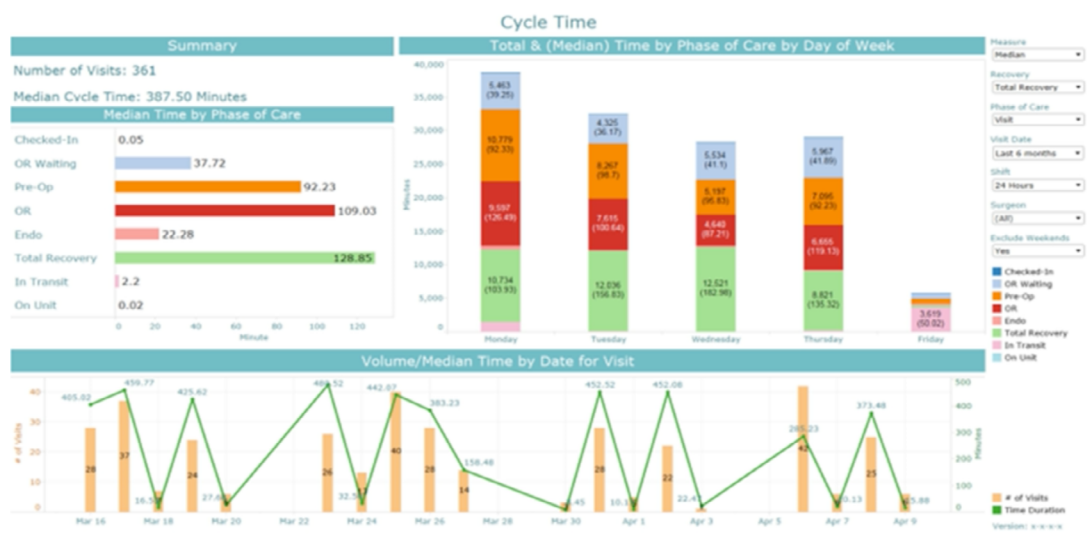
Here is an example of a dashboard from the Florida Hospital Celebration Health that uses location data to show patients at various phases of care.

About Tableau

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