Healthcare Data Analytics-The Future is here

Disha Agarwal
University of Exeter, Exeter EX4, United Kingdom

Abstract: Healthcare data analytics is now at its maximum potential to aid in making healthcare more accessible. The Electronic Health Records (EHR) and clinical analytical domains provide insights on the various methodologies which are currently being used in order to make data driven decisions. The combination of clinical, financial and EHR data can form a critical path for informed decision making.

1. Introduction

In the recent years, the healthcare industry has realized the potential for including data analytics in the care continuum. In order to reach the holistic vision for value based healthcare, it is important to manage your patient population and act proactively rather than reactively. The paradigm shift to a more analytical decision making in healthcare has made exponential growth from the build to the implement phase. The combination of agile and big data is one of the biggest drivers for this shift. In the health-care and pharmaceutical industries, data growth is generated from several sources, including the R&D process, retailers, patients, and caregivers [1]. This data growth enables the patients, providers and pharmaceutical companies to predict adverse events, trends on patient and treatment diagnostics. Two specific fields where there has been an immense growth with big data and analytics are: 1) Population Health Management via Electronic Health Records (EHR) data analytics and 2) Clinical data analytics for improving trial design and operations. With the merger of several data systems, the former field has a magnitude of data which can help understand the healthcare behavioral patterns, chronic care management and timely feedback mechanisms [2]. The latter-clinical analytics is already in its implementation phase by several pharmaceutical companies. With a broad range of study designs, varying data collection methods and time points, efficient data analysis in clinical development has become more important than ever [3]. The goal is to access real-time data from Clinical Trial Management Systems (CTMS) and various other clinical data systems in order to improve analytical decision-making during conduct of a clinical trial [3].

Advantages Making Healthcare more accessible- The Benefits of Big Data and Analytics


The EHR data from millions of patients can provide valuable insights to clinicians on the demographic diagnoses and treatment options. The combination of various data sources can also be helpful in financial calculations to determine the dollar spend on each treatment type. This can be achieved by combining the patient health records, financial records, claims and patient survey [4]. One of the most important benefits is tracking patient progress real time. The physicians have access to real time data which helps them determine the patient engagement, adherence and medical effects. This also helps determine if the treatment has a positive or negative effect in several categories of patients.

In the clinical analytics domain several data sources are used on a daily basis by pharmaceutical companies for trial design, predicting adverse events and streamlining operations. The challenge in clinical trials lies in associating a risk factor to the most likely failure points, establishing procedures to reduce risk at those points and monitoring closely. This process is known as risk-based monitoring (RBM) [5]. RBM allows earlier action to be taken for operational study conduct and provides awareness of the potential for in-study subject risk, enabling corrective action to be taken sooner. The opportunity for analysis of near real-time data analysis becomes a value-based objective [5]. Other clinical applications which are using extensive analytical methodologies are: subject enrollment forecasting, study design and planning and visibility of enrollment trends [6]. With the huge amount of data, it is also important to know the benefit of analyzing the data in various stages of the trial. For example, during the early stages of a clinical trial, access to data is vital not only for patient safety, but for solving problems while they are still manageable and before they become costly [7].

3. Conclusion

The future of big data and analytics has immense value in the payor, provider and patient
partnerships. There would be several use cases in the future where the physicians can connect and leverage various data points to help patients, thereby making healthcare more accessible. The combination of clinical, financial and HER data can form a critical path for informed decision making. The industry is also leaning towards prescriptive analytics which can highlight strengths, weaknesses and opportunities in treatment methods and prescribe better business practices, which will ultimately reduce costs while mitigating care and financial risks for all stakeholders [8].

4. References


