Clinical Analytics-The Next Big Thing to Achieve Value Based Healthcare

Anvita Karara
Carnegie Mellon University, Pittsburgh, United States of America

Abstract: The future goals of the healthcare industry include a shift towards value based models which focus on reducing cost and increasing quality of care. Clinical trials constitute a huge amount of pharmaceutical R&D cost. Incorporating advanced clinical analytical methodologies can help in informed decision making, thereby optimizing clinical planning and execution.

1. Introduction

The healthcare big data analytics market will achieve exponential growth with the shift from fee-for-service towards value based models. The focus on quality healthcare, reduced length hospital stay and lower treatment costs will continue to drive healthcare data analytics [1]. Clinical analytics plays a significant role for informed trial decision making thereby, reducing pharmaceutical R&D cost and ultimately lowering treatment cost. Technologies focusing on predictive, descriptive and prescriptive clinical analytics will expand in coming years. Agile and big data analytics opportunity is especially compelling in complex business environments experiencing an explosion in the types and volumes of available data like the Healthcare industry [2]. According to accountable care organization (ACO) survey findings, more than 1,340 hospital IT leaders nationwide indicated clinical analytics to be their highest prioritized system to acquire over the next year [3]. Keys to success of clinical trials include transparency at all levels, smooth data coordination of related efforts, and regular early detection of problems [4]. Incorporating trial planning and budgeting analytics can help identify healthy sites that consume most resources while producing the least results [4]. This puts the knowledge in the hands of healthcare professionals who can make trials patient centric and reduce costs. Decreased travel costs, shorter reporting time, and lower query and issue resolution time are common return of investment scenarios [4]. Executing the above mentioned analytical workflows is intimidating for many organizations since it requires changing the three dimensional architecture-people, process and technology.

2. Advantages of Incorporating Clinical Analytics in Decision Making

The vast amount of data collected at different phases of the trial can be helpful for informed decision making. As clinical trials become increasingly complex and the clinical project manager is expected to make smarter decisions based on intelligence derived from the clinical trial data, sponsors are looking for ways to incorporate analytics into the trial management systems they are already using [5]. Having real-time clinical metrics and dashboards which provides insights on patient enrollment, study conduct, close-out and reporting is one of the biggest challenges for bio-pharmaceutical R&D industry [6]. Using the country level analysis and layering it with patient data can optimize the selection of countries as well provide real time enrollment insights. Predictive analytics including what if scenario modelling can help in determining the cost benefit analysis for various combinations of country, site investigator and patient models. These data models can be simulated within minutes and help in forecasting the best enrollment curves for the trial, without conducting the trial in real time.

Clinical analytics not only plays a vital role in clinical planning, but also in execution and adaptive conduct. Bayesian models in Phase III randomized clinical trials (RCT) offer the best approach for providing safety data, determining adverse events (AE) association with treatment. An example of this approach-Jacob et al., study tried to illustrate advantage of Bayesian model in achieving reliable information using data of a randomized clinical trial (RCT) in evaluating chemotherapies against acute promyelocytic leukaemia. The results of the study state that among 10 intended journals five were found to have published results from RCTs in the study period and Bayes modelling was the best to provide legitimate information on the AE distribution in a RCT [7].

The advantages of analytics have also been observed in the clinical operations domain for streamlining several task and creating an end to end optimization. Of the $1.2 billion estimated for each research
program, several hundred million dollars are allocated just for clinical trials. The cost for each clinical trial can be as high as tens of millions of dollars, sometimes even higher [8]. Advanced data dashboards can accelerate the drug development process. These dashboards help make proactive decisions and optimize the workflow.

3. Conclusion

As the healthcare industry progresses towards the value based model-reduce cost and enhance patient care, clinical analytics will be an important focus area. The advancement incorporating the analytical methodologies for advanced decision making, is now a necessity. The pharmaceutical companies will need to make significant changes to the current workflow and technology, in order to progress in this dimension. Despite the challenges, incorporation of data analytics has achieved significant advances in clinical planning and execution.

4. References


