Processing Electronic Medical Records to Improve Predictive Analytics for Hospital Readmissions

TREO Talk Paper

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Abstract

Hospital readmissions are costly but largely preventable. In recent years, many researchers have used predictive analytics to build models that can minimize the adverse economic and social consequences of readmissions in chronic diseases. Most of these studies, however, have focused on improving the results either through the development of better models or through employing richer data sets. A smaller number of studies have focused on comprehensive data processing to achieve better predictions. In this study, we propose a new data processing approach that extracts individual- and database-level historical information from the medical records to improve the performance of readmission analytics. We test and validate this method using two rather large data sets that belong to chronic diseases with the highest rates of hospital readmissions. We conclude that processing large data sets with analytics and big data technologies can provide competitive advantages to health care organizations.

Therefore, this effort has four major contributions:

- It demonstrates the value and importance of data processing in developing predictive analytics models for readmission of patients with chronic diseases.
- It shows how overall and individual historical information, which are an important feature of EMR, can be used to augment patient-level records for better prediction results.
- It improves the prediction of hospital readmissions based on EMR data for patients with HF and COPD.
- It provides an evidence for the competitive advantage of organizations that employ predictive analytics and big data technologies for enhanced decision making in health care.