
PREDICTIVE ANALYTICS MODELS FOR ELECTRONIC HEALTH RECORD (LITERATURE REVIEW)

Yuda Syahidin, Pemi Novita Sari,

Manajemen Informasi Kesehatan, Piksi Ganesha Politechnic, Bandung, Indonesia

Abstract

Big data growth in the healthcare community, accurate analysis of medical data supports early disease detection, patient care and community services. However, the accuracy of the analysis decreases when the quality of the medical data is incomplete. In addition, different regions show unique regional disease characteristics, which can weaken the prediction of disease outbreaks. EHR is designed to store patient medical information. Predictive Analytics involves a variety of techniques from modeling, machine learning, and data mining that break down past and present data features to predict the future of medical record data. In this survey paper, we discuss predictive analytical models in the field of EHR that have been made by previous researchers. The purpose of this paper is to provide an overview of future research opportunities in building a Predictive Analytics Model for Electronic Health Records

Keywords: Predictive Analytics, Electronic Health Record, Machine Learning

Introduction

The rapid development of the internet, electronic medical information has become popular in all cities and around the world, such as electronic health records (EHR) to replace paper medical records, online appointments, and online reports, so that the volume of data growth is growing and many have encouraged research. intensive in the development of technological devices to store, manage, and analyze data in the health sector (Hong dkk, 2019). Even though there is still a large portion of health data that is still not utilized, for this it is necessary to carry out Unstructured Data Analysis to become the next innovation in data science in the health sector. Scalability and efficiency in analyzing medical record data are still lacking in generating Electronic Health Reports, there is still a lack of a decision-making system in the health sector because there is still unstructured health data.

The use of Electronic Health Records (EHR) makes it possible to analyze large amounts of medical data (Shickel dkk, 2017). Recently Deep Learning Techniques can play an important role in managing the huge medical data that has been generated every day (Ismail dkk, 2020; Xu dkk, 2020)]. In addition, deep learning achieves success in multiple fields by effectively constructing deep hierarchical features.

Predictive analytics is one of the critical areas of clinical science to offer better care to patients. Predictive Analytics helps optimize resource costs and provide better care to patients in resource-constrained environments. This helps make the diagnosis of doctors in providing patients with faster and better treatment. methods of translating current data into new, unexpected situations and environments that can contribute to a more in-depth knowledge of disease-related information, such as better monitoring of different phases of disease, and identifying disease onset. The result is improved quality of care to patients, increased support for physicians, and easy validation of standard diagnostic procedures for disease, and provision of healthcare services to patients. In recent years, most of the methods used to evaluate large EHR data for predictive models are based on machine learning and standard statistical techniques used in making informed decisions about complex issues such as clinical trial results (Jensen dkk, 2012), as well as in predictive analysis to determine the likelihood of predicting patient re-admission to the hospital.

The Electronic Health Record (EHR) is an increasingly common data source for clinical risk prediction, presenting unique analytical opportunities and challenges [3]. The thing that needs to be considered and is a challenge in making predictions about Electronic Medical Record data is that predictive algorithms have good performance depending on data representation and selection of appropriate features. Another challenge in feature selection is analyzing, selecting, and evaluating raw EHR data which can be time-consuming and often requires trials and determination of possible predictive variables in EHR potentially in the thousands, especially when clinical records are unclear from doctors,