Predictive Analytics in Healthcare: Early Detection of Chronic Diseases Using EHR Data

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Abstract: *Chronic diseases like diabetes and hypertension are among the leading causes of illness and healthcare spending around the world. Detecting these conditions early can make a big difference helps patients get timely treatment and easy the strain on healthcare systems. In this study, we look at how machine learning can be used with Electronic Health Record (EHR) data to create early-warning systems for predicting chronic diseases.*

We used structured data such as lab results, medical diagnoses, prescribed medications, and patient demographics to train several predictive models. Out of all the models we tested, XGBoost and Random Forest delivered the best performance in terms of accuracy and AUC (area under the ROC curve). We also identified which features were most important for prediction and discussed how integrating these models into everyday clinical practice could support earlier interventions and better disease management.

Keywords: *Chronic diseases.*