

Predictive Analysis of Cardiovascular Disease Risk Factors in Romania using Machine Learning and Medical Statistics

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Abstract

Cardiovascular disease (CVD) remains one of the leading causes of morbidity and mortality in Romania, being a severe public health problem. The aim of the present study was to identify and assess the significant risk factors of CVD and develop evidence-based prevention strategies. To do this, we used machine learning algorithms such as logistic regression, random forests, support vector machines (SVM), and artificial neural networks (ANNs) to forecast cardiovascular risk factors from past medical data and epidemiology trends. We also used inferential methods such as logistic regression, Cox proportional hazards models, and survival analysis for validation and interpretation of results. Our findings identify the most powerful determinants of cardiovascular disease in Romania, with an integrated risk model evaluation. Based on our findings, a series of preventive interventions and policy recommendations for cardiovascular risk reduction at the individual and population levels can be implemented. Our results are able to assist health authorities in planning more successful intervention programs and provide individuals with useful strategies with which to reduce their own risk of CVD.

Keywords: Cardiovascular Disease (CVD); Risk Factors; Machine Learning; Medical Statistics; Predictive Modeling.

