

Analysis of Risk Factors for Coronary Heart Disease Based on Medical Records of Inpatients Using the C4.5 Algorithm at RSD dr. Soebandi Jember

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ABSTRACT

In the morbidity and mortality data at RSD Dr. Soebandi Jember in 2020-2024 experienced fluctuations. In terms of age, the majority of sufferers are productive aged between 15-64 years. The impact that has occurred is an increase in cases of coronary heart disease which is getting higher and decreasing productivity at a productive age. The purpose of this study was to analyze risk factors for coronary heart disease based on medical records of inpatients using the C4.5 Algorithm at RSD dr. Soebandi Jember. The number of samples used was 151 coronary heart disease and 151 non-coronary heart disease with 9 attributes namely age, gender, smoking status, high blood pressure, dyslipidemia, diabetes mellitus, obesity, physical inactivity, and family history of coronary heart disease. This research uses the C4.5 algorithm method with RapidMiner tools and implements k-fold cross validation. Determination of risk factors is known in the decision results in the form of classification rules. The implementation of k-fold cross validation produces the highest accuracy at k=8, namely accuracy of 86.09%, precision of 82.63%, and recall of 91.39%. Based on the results, diabetes mellitus is the most influential risk factor for coronary heart disease because it has the highest gain ratio value. Other risk factors are physical inactivity, gender, obesity, high blood pressure, age, and smoking. Suggestions for dr. Soebandi Hospital are to improve Communication, Information, Education (IEC), especially for Diabetes Mellitus patients because it affects Coronary Heart Disease.

Keywords: Coronary Heart Disease, risk factors, C4.5 algorithm, RapidMiner, k-fold cross validation.