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## Development of predictive model for survival of pediatric HIV/AIDS patients in south western Nigeria using data mining techniques

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This study identified survival variables for HIV/AIDS pediatric patients, developed predictive models for determining the survival of the patients who were receiving anti-retroviral drug in the southwestern Nigeria based on identified variables, compared the developed models and validated the models with the historical data. Interviews were conducted with the virologists and pediatrician at two health institutions from the study area in order to identify survival variables for HIV/AIDS pediatric patients. Pediatric HIV/AIDS patients' data (216) were also collected preprocessed and the 10-fold cross validation technique was used to partition the datasets into training and testing data. Predictive models were developed using three supervised learning techniques (Naive Bayes' classifiers, Decision trees and the Multi-Layer Perception (MLP)) and the Waikato Environment for Knowledge Analysis (WEKA) was used to simulate the models in which CD4 count, viral load, opportunistic infections and nutritional status were used as the independent variables for the prediction. The result showed that all the three techniques (Naive Bayes' classifiers, Decision trees and the Multi-layer perception (MLP)) were suitable in carrying out the task of forecasting the survival of pediatric HIV/AIDS patients. The Decision tree model has an accuracy of 99.07% (214 correct classifications out of 216), 0.0183 mean absolute error rate, 0.0962 root mean square error, 3.69% relative absolute error and 0.993 ROC area showing that the level of bias was very low (0.007). Naive Baye's model has an accuracy of 81.02% (175 correct classifications out of 216), the mean absolute error rate was 0.2025, 0.2920 for the root mean square error, 40.92% for the relative absolute error and 0.993 for ROC area with (0.007) level of bias. Multilayer perception model also has an accuracy of 99.07% (214 correct classifications out of 216) the mean absolute error rate was 0.022, 0.0962 for the root mean square error and 4.48% for the relative absolute error. The ROC area for the model was also 0.992 showing that the level of bias was also very low (0.008). The result of the three models showed that the decision tree technique was the most viable in predicting survival among HIV/AIDS pediatric patients in south western Nigeria.

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