

## Data Mining Model for Predicting the Status of HIV Patients during Drug Regimen Change

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**Abstract :** Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS) is a major cause of death for most African countries. Ethiopia is one of the seriously affected countries in sub Saharan Africa. Previously in Ethiopia, having HIV/AIDS was almost equivalent to a death sentence. With the introduction of Antiretroviral Therapy (ART), HIV/AIDS has become chronic, but manageable disease. The study focused on a data mining technique to predict future living status of HIV/AIDS patients at the time of drug regimen change when the patients become toxic to the currently taking ART drug combination. The data is taken from University of Gondar Hospital ART program database. Hybrid methodology is followed to explore the application of data mining on ART program dataset. Data cleaning, handling missing values and data transformation were used for preprocessing the data. WEKA 3.7.9 data mining tools, classification algorithms, and expertise are utilized as means to address the research problem. By using four different classification algorithms, (i.e., J48 Classifier, PART rule induction, Naïve Bayes and Neural network) and by adjusting their parameters thirty-two models were built on the pre-processed University of Gondar ART program dataset. The performances of the models were evaluated using the standard metrics of accuracy, precision, recall, and F-measure. The most effective model to predict the status of HIV patients with drug regimen substitution is pruned J48 decision tree with a classification accuracy of 98.01%. This study extracts interesting attributes such as Ever taking Cotrim, Ever taking TbRx, CD4 count, Age, Weight, and Gender so as to predict the status of drug regimen substitution. The outcome of this study can be used as an assistant tool for the clinician to help them make more appropriate drug regimen substitution. Future research directions are forwarded to come up with an applicable system in the area of the study.

**Keywords :** HIV drug regimen, data mining, hybrid methodology, predictive model

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