DEVELOPING A PREDICTIVE MODEL FOR INTERRUPTIONS IN TREATMENT (IIT) IN NIGERIA

Authors: Francis Muoghalu¹, Kehinde Balogun², Olaposi Olatoregun², Gibril Gomez², Ademola Oladipo³, Bamidele Moyosola³, Steve Job², Nnamdi Umeh² Williams Nwogbo², Tobechi Nnakwe², Uche Chinedu², Toyeeb Abdulfatai², Johnson Alonge², Oludare Onimode², Jay Samuels²



INTRODUCTION

Patient interruption in treatment (IIT) by clients on antiretroviral therapy (ART) continues to limit the country's progress toward achieving HIV epidemic control. Various interventions have been used to reduce IIT such as behavioral modifications, differentiated service delivery, multimonth dispensing, family-centered care etc.

We explored data for clients who are on treatment and developed a machine learning model to train and predict the possibilities of PLHIV clients experiencing treatment interruptions before it occurs. We used National Data Repository (NDR).

INTERVENTIONS



METHOD/MATERIAL

We pulled 620,958 observations from the NDR line list. Data were cleaned using R-studio. A deduplication analysis was conducted to ensure that there are no duplicates on the dataset with 252,278 as the final dataset for the model. Variable checking was also conducted on the dataset to remove the outliers and data imbalance. Machine learning model algorithm and analysis were implemented using python, structured to solve a binary classification problem using logistics regression with integration of decision tree to cluster patients visit into groups in order to estimate the most important interaction among the subgroups population.



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RESULT

The IIT predictive model area under curve (AUC) determined through 5-fold cross validation is **0.885 ± 0.002** with an accuracy of **92%, 90%** model sensitivity (proportion of inactive visits marked as inactive) and **63%** specificity (proportion of active visits marked as active) respectively, predicting a missing visit by flagging at least **90%** of inactive patients.

CONCLUSION

Predictive modelling is a useful way of preventing interruption in treatment by identifying clients more likely to experience IIT and institute preventive interventions at facility level. Programs should embrace artificial Intelligence and Machine learning as a strategy to improve Patients' outcomes.

KEYWORDS



Various interventions used to reduce IIT.

Overview of steps taken in building the predictive model

Centers for Disease Control and Prevention,
Anti-Retroviral Therapy, Human Immunodeficiency virus, People Living with HIV, President's Emergency Plan for AIDS Relief, interruption in treatment, Area Under Curve,
Loss to follow up, National data repository.

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