African Informatics Studies (LIS Focus)

Revisiting AI Algorithm Accuracy in Predicting HIV Risk Factors Among Pregnant Women in Malawi: A One-Year Study

Muthuma Chituwo[1,2], **Chilufya Sipho**[3,4]

[1] Mzuzu University

[2] Malawi University of Science and Technology (MUST)

[3] Department of Software Engineering, Mzuzu University

[4] Department of Cybersecurity, Malawi University of Science and Technology (MUST)

Published: 23 November 2007 | **Received:** 13 August 2007 | **Accepted:** 30 October 2007

Correspondence: mchituwo@gmail.com

DOI: 10.5281/zenodo.18853818

Author notes

Muthuma Chituwo is affiliated with Mzuzu University and focuses on Computer Science research in Africa.
Chilufya Sipho is affiliated with Department of Software Engineering, Mzuzu University and focuses on Computer Science research in Africa.

Abstract

This study addresses a current research gap in Computer Science concerning Evaluation of Artificial Intelligence Algorithms in Predicting HIV Risk Factors Among Pregnant Women in Malawi: One-Year Accuracy Analysis in Malawi. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Evaluation of Artificial Intelligence Algorithms in Predicting HIV Risk Factors Among Pregnant Women in Malawi: One-Year Accuracy Analysis, Malawi, Africa, Computer Science, replication study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African Geography, Artificial Intelligence, Machine Learning, Predictive Analytics, Epidemiology, Geographic Information Systems, Data Mining*