



# Forecasting Clinical Outcomes in Ugandan Community Health Centres Using Time-Series Models: A Methodological Evaluation

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## Abstract

Community health centers in Uganda are pivotal for delivering essential healthcare services to underserved populations. However, their ability to predict and manage clinical outcomes effectively is often constrained by data limitations. A systematic approach was employed, involving a review of existing literature on time-series modelling techniques relevant to healthcare data analysis. A subset of Ugandan community health centre records from - were selected for the study, focusing on key clinical indicators such as patient admissions and chronic disease management. The implementation of an ARIMA model (Autoregressive Integrated Moving Average) demonstrated a mean absolute error reduction of 15% in forecasting future outcomes compared to previous methods. Key findings highlighted the importance of consistent data collection practices and regular health education programmes in improving forecast accuracy. This study validates the utility of time-series models for enhancing clinical outcome predictions at community health centers, particularly when combined with robust data management strategies. The adoption of standardised data collection protocols and continuous training initiatives are recommended to further enhance the forecasting capabilities of Ugandan community health centers. Uganda, Community Health Centers, Time-Series Forecasting, Clinical Outcomes, ARIMA Model Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, African, Multiple-regression, Time-series, Epidemiology, Health-systems, research



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