



Time-Series Forecasting Model Evaluation for Risk Reduction in District Hospitals Systems, Uganda

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Abstract

This study focuses on evaluating the effectiveness of time-series forecasting models in reducing operational risks within district hospitals in Uganda. A comprehensive analysis was conducted using ARIMA (AutoRegressive Integrated Moving Average) model for time series forecasting. The study utilised historical data from district hospitals in Uganda, focusing on key operational metrics such as patient admissions and bed occupancy rates. The ARIMA model demonstrated a significant reduction in forecast errors by approximately 15%, indicating its effectiveness in predicting future hospital load trends with reasonable confidence (95% CI). The findings suggest that the chosen time-series forecasting models can be reliable tools for district hospitals to better manage operational risks and improve service delivery. Based on the study's results, it is recommended that further research should explore the implementation of these models in real-world hospital settings to validate their practical utility. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Hospital, Systems, Forecasting, Analytics, Model, Evaluation*

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