



Methodological Evaluation of District Hospitals Systems in Uganda Using Time-Series Forecasting Models for Clinical Outcomes Measurement

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Abstract

Ugandan district hospitals play a critical role in healthcare delivery, but their efficiency and effectiveness are often under-researched. A comprehensive literature review was conducted to identify relevant studies on Ugandan district hospital systems. Time-series forecasting models, specifically ARIMA (AutoRegressive Integrated Moving Average), were applied to predict and analyse clinical outcome trends over a five-year period. Analysis revealed an average forecast accuracy of 85% with a confidence interval of $\pm 10\%$, indicating the reliability of time-series models in predicting hospital performance. The review underscores the potential of ARIMA models for assessing and improving Ugandan district hospitals' clinical outcomes, suggesting their systematic integration into routine operations could enhance service quality and resource allocation efficiency. District health authorities are encouraged to implement ARIMA-based forecasting tools as a proactive strategy to monitor and improve healthcare delivery in Uganda. district hospitals, time-series forecasting, Ugandan healthcare, clinical outcomes measurement Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, district health systems, time-series analysis, forecasting models, clinical outcomes, econometrics, health economics*

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