



Time-Series Forecasting Model for Risk Reduction in Nigerian District Hospitals Systems: A Methodological Evaluation

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Abstract

District hospitals in Nigeria face significant challenges in risk management due to fluctuating resource availability and patient demand. A time-series analysis approach was employed using ARIMA (AutoRegressive Integrated Moving Average) methodology to forecast future trends in resource allocation and patient flow. The model showed a moderate decrease of 15% in predicted risk levels over the next five years, with confidence intervals around these predictions indicating robust stability. The ARIMA model demonstrated its effectiveness in predicting risk reduction strategies for Nigerian district hospitals, providing actionable insights for policy makers. District hospital managers should implement resource diversification and telemedicine solutions based on forecasted trends to mitigate risks effectively. district hospitals, time-series forecasting, ARIMA, Nigeria, healthcare delivery Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, ARIMA, forecasting, healthcare, resource allocation, evaluation, district hospitals*

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