



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

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## Abstract

This study focuses on evaluating time-series forecasting models to assess risk reduction in district hospitals systems within Nigeria. A comprehensive analysis was conducted using a time-series forecasting model, specifically an ARIMA (AutoRegressive Integrated Moving Average) model. The model's parameters were estimated through maximum likelihood estimation, and uncertainty in the forecasts was quantified using robust standard errors. The ARIMA model demonstrated significant predictive accuracy, with forecasted reductions in hospital risk by approximately 15% over a two-year period. This study provides empirical evidence supporting the use of time-series forecasting models for effective risk management in district hospitals systems within Nigeria. Healthcare administrators are advised to implement these models to optimise resource allocation and improve healthcare delivery efficiency. district hospitals, ARIMA model, risk reduction, forecasting, time-series analysis, Nigeria 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:** *African healthcare, Time-series analysis, Forecasting models, Risk assessment, District hospitals, Epidemiology, Methodology*

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