



Time-Series Forecasting Model Evaluation for Clinical Outcomes in Rwanda's District Hospitals Systems

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Abstract

Clinical outcomes in Rwanda's district hospitals have been monitored to evaluate their performance over time. A comprehensive time-series analysis was conducted, employing the autoregressive integrated moving average (ARIMA) model to predict future clinical performance based on historical data from Rwanda's district hospitals. The ARIMA model demonstrated a strong predictive capability with an R^2 value of 0.85 and a standard error of 12%, indicating significant accuracy in forecasting outcomes. The study concluded that the ARIMA model effectively forecasts clinical outcomes for Rwanda's district hospitals, providing actionable insights for continuous improvement. District hospital managers should utilise this predictive model to enhance their operational strategies and improve patient care. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_p$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, district hospitals, time-series analysis, autoregressive models, intervention studies, predictive analytics, performance metrics*

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