



Time-Series Forecasting Model Evaluation for Yield Improvement in South African District Hospitals Systems,

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Abstract

This study focuses on evaluating the performance of time-series forecasting models in predicting yield improvement for South African district hospitals systems over a decade. A comprehensive review of existing literature on time-series analysis was conducted. The study utilised ARIMA (AutoRegressive Integrated Moving Average) as the primary statistical model for yield prediction, incorporating robust standard errors to account for forecast uncertainty. The analysis revealed a significant improvement in hospital efficiency with an average forecast accuracy rate of 85% across all districts, indicating substantial potential for systematic yield enhancement through forecasting models. This study underscores the efficacy of ARIMA in predicting healthcare system yield improvements and recommends its adoption as a standard tool for district hospitals management. Adoption of ARIMA forecasts should be considered alongside other quality improvement initiatives to ensure comprehensive coverage of hospital operational metrics. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Forecasting, Time-Series, Evaluation, Methodology, Performance, Models

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