African Creative Writing Research (Humanities)

Time-Series Forecasting Model for Evaluating Cost-Effectiveness of District Hospital Systems in South Africa: A Methodological Assessment

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Abstract

The evaluation of district hospital systems in South Africa is crucial for improving healthcare access and outcomes, particularly given the significant financial investment in these facilities. The methodology employed involves collecting historical data on hospital expenses, patient admissions, and service utilization over various periods. A time-series analysis framework is utilised to forecast future trends and evaluate cost-effectiveness using a Box-Jenkins ARIMA model. Robust uncertainty measures are incorporated into the forecasting process to enhance reliability. The preliminary findings suggest that there is a significant fluctuation in patient admissions, with an average annual increase of approximately 5% over the past decade, which has implications for resource allocation and budget planning. The Box-Jenkins ARIMA model demonstrates promising results in forecasting future trends. These insights can inform policy decisions aimed at enhancing cost-effectiveness and operational efficiency within district hospital systems. Policy recommendations include targeted interventions to manage patient admissions, optimise resource utilization, and implement preventive healthcare programmes to reduce long-term costs. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, econometric, forecasting, healthcare, resource allocation, performance measurement, time-series*

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