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Methodological Evaluation of District Hospitals Systems in Uganda Using Time-Series Forecasting Models for Efficiency Measurement

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Abstract

The healthcare sector in Uganda faces significant challenges related to resource allocation and operational efficiency across district hospitals. A time-series forecasting model was employed to analyse historical data from selected district hospitals. The model utilised ARIMA (AutoRegressive Integrated Moving Average) for trend and seasonal decomposition. The forecast indicated that if current trends continue, there will be a modest increase in efficiency over the next five years, with an estimated growth rate of approximately 5%. Time-series forecasting models provided insights into potential improvements and challenges within Ugandan district hospital systems. District health authorities should consider implementing preventive maintenance schedules to mitigate future inefficiencies. Healthcare efficiency, time-series analysis, ARIMA model, Ugandan district hospitals Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, District Hospitals, Time-Series Analysis, Forecasting Models, Efficiency Measurement, Resource Allocation, Health Economics*

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