



# Time-Series Forecasting Model for Evaluating Cost-Effectiveness of District Hospitals in Uganda

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## Abstract

District hospitals in Uganda face challenges related to cost-effectiveness due to varying patient volumes over time. A time-series forecasting model incorporating ARIMA (AutoRegressive Integrated Moving Average) was employed to predict hospital cost trends. Monthly patient volume fluctuations were found to significantly influence total operating costs, with variations up to 20% between months. The ARIMA model effectively predicted future costs based on historical data, providing insights for policymakers and resource allocation. Policymakers should consider implementing flexible staffing arrangements to match patient volumes dynamically. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, ARIMA, forecasting, healthcare economics, district hospitals, time-series, econometrics

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