



Methodological Evaluation of District Hospitals Systems in Kenya Using Time-Series Forecasting Models for Cost-Effectiveness Analysis, Context

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Abstract

District hospitals in Kenya play a crucial role in healthcare delivery, but their operational costs often exceed revenue, leading to financial sustainability concerns. A systematic literature review approach was employed to synthesize existing research on the operational and financial aspects of district hospitals. Time-series forecasting models, including ARIMA (Autoregressive Integrated Moving Average) were utilised to predict future costs and revenues. The findings indicate a significant underestimation of healthcare costs in current forecasts, with an average error margin of $\pm 15\%$, highlighting the need for more accurate cost data integration into decision-making processes. While ARIMA models provided valuable insights into forecasting trends, their accuracy was compromised by insufficient historical data and variability in operational conditions across different districts. More comprehensive datasets should be gathered to enhance model accuracy. Regular reviews of hospital financial models are recommended to ensure ongoing cost-effectiveness and sustainability. district hospitals, time-series forecasting, cost-effectiveness analysis, healthcare economics Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Hospitals, Systematic, Literature, Methodology, Forecasting*

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