Forecasting Cost-Effectiveness in Ethiopian District Hospitals Using Time-Series Models: A Methodological Assessment

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Abstract

The study aims to evaluate the cost-effectiveness of healthcare services in Ethiopian district hospitals by utilising time-series forecasting models. A time-series analysis was employed to model the historical data from Ethiopian district hospitals. The Box-Jenkins methodology was utilised for forecasting purposes, including ARIMA models with robust standard errors provided. The forecasted cost-effectiveness showed a significant decline in healthcare expenditure over the next five years, indicating potential savings if improved resource allocation strategies are implemented. The study concludes that time-series models can effectively predict future costs and outcomes of district hospitals, offering insights for policy-makers to enhance efficiency and effectiveness. Policy-makers should consider implementing cost-saving measures based on the forecasted data to ensure sustainable healthcare services in Ethiopian district hospitals. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\rightarrow}p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Ethiopia, District Hospitals, Time-Series Analysis, Cost-Benefit Assessment, Forecasting Models, Health Economics, Methodology*

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