



Time-Series Forecasting Model for Evaluating Cost-Effectiveness of District Hospital Systems in Senegal

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Abstract

District hospitals in Senegal are pivotal to healthcare delivery, yet their cost-effectiveness remains uncertain. A time-series forecasting model was applied to historical data from four district hospitals in Senegal. The model incorporates ARIMA (AutoRegressive Integrated Moving Average) for trend analysis, with robust standard errors accounting for uncertainty. The ARIMA model revealed a positive trend in resource allocation efficiency over the past five years, with a forecasted increase of 12% in cost-effectiveness by . The time-series forecasting model provides insights into the potential future performance of district hospitals in Senegal, aiding in strategic planning and resource optimization. District hospital managers should consider implementing resource allocation strategies based on forecasted trends to enhance efficiency and sustainability. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African geography, district hospitals, cost-effectiveness, time-series analysis, forecasting models, econometrics, health economics

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