



Methodological Evaluation and Cost-Effectiveness Analysis of Community Health Centre Systems in Kenya Using Time-Series Models

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Abstract

This study evaluates community health centre systems in Kenya, focusing on their methodological evaluation and cost-effectiveness. Time-series analysis will be applied using ARIMA (AutoRegressive Integrated Moving Average) models to forecast health centre operations costs and outcomes, with uncertainty quantified through bootstrapping techniques. A clear trend of decreasing healthcare utilization rates was observed over the study period, suggesting potential inefficiencies in resource allocation. The ARIMA models provided reliable forecasts but were sensitive to initial conditions, highlighting the need for ongoing monitoring and adjustment strategies. Health authorities should consider implementing adaptive management practices based on model feedback to optimise resource distribution. Community Health Centers, Time-Series Forecasting, Cost-Effectiveness Analysis, ARIMA Models, Kenya Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Geography, HealthServiceEvaluation, TimeSeriesAnalysis, ARIMA, ForecastingModel, CostEffectivenessAnalysis

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