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Time-Series Forecasting Model for Evaluating Cost-Effectiveness of Community Health Centres in Tanzania

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Abstract

Community health centres in Tanzania have been established to improve access to healthcare services, but their cost-effectiveness over time remains a subject of interest. A time-series forecasting model, incorporating ARIMA (AutoRegressive Integrated Moving Average) methodology, was used to predict healthcare expenditure over time in Tanzanian community health centres. This approach accounts for autocorrelation and seasonality inherent in the dataset. The analysis revealed a significant upward trend in healthcare costs from to , with an estimated increase of 5% per annum, suggesting ongoing financial strain on these facilities. While the model indicated increasing costs, it also highlighted potential areas for cost savings through evidence-based interventions and improved resource allocation strategies. Based on findings, recommendations include exploring targeted public health initiatives to mitigate rising healthcare expenditure while ensuring service continuity. Treatment effect was estimated with $text{ logit }(pi)=beta 0+vec{beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, health economics, time-series analysis, forecasting, econometrics, healthcare access, cost-benefitanalysis*

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