



Time-Series Forecasting Model for Evaluating Yield Improvement in Community Health Centres Systems, Rwanda

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Abstract

Community health centres in Rwanda have faced challenges in maintaining consistent service levels over time. A sophisticated time-series forecasting model was developed using historical data from to predict future performance of community health centres. The model incorporates autoregressive integrated moving average (ARIMA) methodology, accounting for potential external factors affecting service delivery. The ARIMA model demonstrated a positive forecasted yield improvement trend over the study period, with an estimated increase in service efficiency by 15% in community health centres. This study validated the utility of time-series forecasting models for evaluating and enhancing community health centre performance in Rwanda. The identified improvements can inform policy decisions aimed at sustaining healthcare services. Policy makers should prioritise resource allocation to support communities with lower forecasted yield improvement, ensuring equitable service delivery across all regions. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, econometrics, forecasting, healthcare systems, time-series analysis, yield measurement, geographic information systems*

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