



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

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Abstract

The Rwanda Community Health Centres (CHCs) system aims to improve healthcare access in rural areas by providing basic medical services and preventive care. A time-series forecasting model was employed using ARIMA (AutoRegressive Integrated Moving Average) methodology with robust standard errors estimated at 95% confidence intervals. The forecast indicated an improvement in CHC operational efficiency by a factor of 10%, with specific trends showing increased patient flow and reduced service delivery times. The ARIMA model accurately predicted yield improvements, supporting the effectiveness of community health centres in Rwanda's healthcare system. Continuous monitoring and periodic recalibration of the forecasting model are recommended to ensure its continued accuracy and relevance. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Community Health Centres, Time-Series Analysis, Forecasting Models, Epidemiology, Public Health, Geographic Information Systems*

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