Time-Series Forecasting Model for Measuring Adoption Rates in Community Health Centres in Rwanda: A Methodological Evaluation

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Abstract

Community health centres (CHCs) in Rwanda have been established to improve access to healthcare services. However, there is a need to evaluate their effectiveness and adoption rates over time. The study employed an autoregressive integrated moving average (ARIMA) model to forecast adoption rates based on historical data from selected CHCs. Uncertainty was quantified using robust standard errors. A significant positive trend in the adoption rate of CHCs over the past five years emerged, indicating that more than half of the surveyed centres have adopted essential services by year six. The ARIMA model accurately forecasted these trends with a confidence interval of ±5% for future predictions. Further research should explore factors influencing CHC adoption and consider implementing interventions to enhance service provision. Community Health Centres, Forecasting Model, Adoption Rate, Rwanda Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\top} p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, Time-series, Forecasting, Adoption, Evaluation, Models*

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