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

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Abstract

Community health centres in Rwanda have been established to improve access to healthcare services, but their effectiveness varies over time. A time-series analysis was conducted using an ARIMA (AutoRegressive Integrated Moving Average) model to forecast adoption rates, with uncertainty quantified by robust standard errors. The model demonstrated a significant correlation between the number of years since establishment and the rate of adoption, showing a moderate increase over time (15% per year). The ARIMA model provided reliable predictions for the future adoption rates in Rwanda's community health centres, offering insights into system development strategies. Further research should explore additional factors influencing adoption and validate these findings across different regions in Rwanda. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\frown}p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Geographic Information Systems (GIS), Spatial Analysis, Time-Series Analysis, ARIMA Model, Forecasting, Evaluation*

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