Forecasting Risk Reduction in Community Health Centres Systems Using Time-Series Models in Rwanda: A Methodological Evaluation

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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 historical data from Rwanda's community health centres to forecast future trends in service utilization and healthcare outcomes. The model predicted a steady decline in patient visits by 5% annually, with an uncertainty range of ±2% based on robust standard errors. The time-series forecasting model demonstrated promising results for predicting risk reduction in community health centres, offering a reliable tool for policymakers and planners. Further research should explore the model's applicability across different regions and healthcare systems to validate its generalizability. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\to}p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Geographic Information Systems (GIS), Health Informatics, Time-Series Analysis, Epidemiology, Predictive Modelling, Public Health Surveillance*

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