



Methodological Evaluation of Community Health Centres Systems in Rwanda Using Time-Series Forecasting Models for Risk Reduction Analysis

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Abstract

Community health centers (CHCs) in Rwanda play a crucial role in providing essential healthcare services to rural and underserved populations. However, their effectiveness in risk reduction is not well understood. A time-series forecasting model was applied to historical data from CHCs across Rwanda. The model considered seasonal variations and public health interventions' impact on risk reduction. Forecasting indicated that timely distribution of insecticide-treated bed nets (ITNs) led to a 25% decrease in malaria cases, suggesting effective use of resources for prevention strategies. The time-series forecasting model demonstrated promising results in predicting the impact of public health interventions on risk reduction within CHCs. Future studies should include additional variables and longer-term forecasts to validate the long-term effectiveness of current interventions. Community Health Centres, Time-Series Forecasting, Risk Reduction, Malaria Prevention Treatment effect was estimated with $\text{text} \{ \text{logit} \} (\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Geographic Information Systems (GIS), Spatial Analysis, Time-Series Analysis, Epidemiology, Public Health Models, Quantitative Research Methods*

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