



Evaluation of Community Health Centre Systems in Rwanda through Time-Series Forecasting Models for Adoption Rate Measurement

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Abstract

Community health centres (CHCs) play a crucial role in healthcare delivery across Rwanda, yet their effectiveness and adoption rates vary over time. A time-series analysis was conducted with a Mixed-effects model for predicting future adoption rates, incorporating data from multiple CHCs across different regions. The mixed-effects model predicted an increase in CHC adoption by 15% over the next five years, with a confidence interval of ± 3 percentage points. The study confirmed that time-series forecasting can be effectively used to measure and predict adoption rates for community health centres in Rwanda. Policy makers should consider these forecasts to plan future resource allocation and infrastructure development for CHCs. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Community health centers, Rwanda, Time-series analysis, Forecasting models, Public health, Epidemiology, Quantitative methods*

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