



Methodological Evaluation of Community Health Centres in Nigeria: Time-Series Forecasting for Adoption Rate Measurement

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Abstract

Community health centres in Nigeria have been established to improve access to healthcare services. However, their adoption rates vary significantly across different regions. A systematic literature review was conducted, focusing on methodologies employed in studies examining community health centre adoption rates. A time-series forecasting model incorporating ARIMA (AutoRegressive Integrated Moving Average) was proposed as a tool for measuring these rates with precision and reliability. The analysis revealed that the proportion of regions where community health centres have been effectively adopted ranges from 20% to 45%, with notable variability across states in Nigeria. This review highlights the importance of adopting robust methodological approaches for evaluating healthcare infrastructure adoption. The proposed ARIMA model offers a significant advancement in accurately forecasting adoption rates, thereby aiding policy formulation and resource allocation. Health policymakers should consider using the ARIMA model to forecast future adoption rates of community health centres based on historical data trends. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, Community Health Centres, Time-series Analysis, Forecasting Models, Evaluation Metrics, Public Health Systems*

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