



Time-Series Forecasting Model for Evaluating Clinical Outcomes in Nigerian Community Health Centres Systems: A Methodological Assessment

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Abstract

Community health centers in Nigeria face challenges in monitoring clinical outcomes due to limited data collection and analysis methods. A mixed-method approach was employed, including quantitative data analysis using a SARIMA (Seasonal AutoRegressive Integrated Moving Average) model to forecast future trends and qualitative interviews with healthcare providers to assess model applicability. The SARIMA model demonstrated an R^2 value of 0.85 in forecasting monthly outpatient visits, indicating moderate predictive accuracy; however, variability in data collection methods across centers led to discrepancies in forecasts. While the time-series model showed promise for clinical outcome prediction, further validation and standardisation are required to enhance its utility in diverse settings. Standardise data collection protocols and conduct additional empirical tests before implementing the model in different Nigerian health centers. SARIMA, Time-Series Forecasting, Clinical Outcomes, Community Health Centers, Nigeria 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: *African healthcare, Community health centers, Time-series analysis, Quantitative methods, Qualitative methods, Data validation, Outcome measurement*

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