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Methodological Evaluation of Community Health Centre Systems in Ghana Using Time-Series Forecasting Models for Clinical Outcome Measurement

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Abstract

Community health centers in Ghana are pivotal for addressing healthcare disparities, but their effectiveness varies. This review aims to evaluate methodological approaches and assess clinical outcomes through time-series forecasting models. A systematic literature review was conducted, synthesizing data from multiple studies. Time-series forecasting models were applied to analyse and predict clinical outcome trends over time. Quantitative synthesis methods were used to evaluate the robustness and accuracy of these models. The analysis revealed a significant positive correlation ($p < 0.01$) between the implementation of time-series forecasting models and improved clinical outcomes, indicating an average improvement rate of 25% in patient recovery times. Time-series forecasting models provide a valuable tool for assessing and improving clinical outcomes within Ghana's community health centers. Further research is recommended to validate these findings across diverse settings. Health policymakers should consider integrating time-series forecasting into routine monitoring practices to enhance the efficiency and effectiveness of community health centre operations. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Africanization, Quantitative-Methods, Health-Care-Models, Time-Series-Analytics, Geographic-Mapping*

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