



Methodological Evaluation of Community Health Centers Systems in Ghana Using Time-Series Forecasting for Risk Reduction Assessment

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Abstract

Community health centers in Ghana are crucial for providing essential healthcare services to underserved populations. However, their effectiveness and sustainability require rigorous evaluation. A longitudinal study employing a time-series forecasting model was conducted over two years. Data on patient visits and outcome measures were collected from ten randomly selected health centers. During the study period, there was a significant reduction in trauma-related mortality rates by 15% (95% CI: -20% to -10%) among patients who received timely interventions through community health centers. The time-series forecasting model successfully predicted and measured risk reduction, highlighting the effectiveness of community health centre systems in improving patient outcomes. Future studies should expand the study scope to include more health centers and incorporate predictive analytics for resource allocation and service improvement. Treatment effect was estimated with $\text{text} \{ \logit \} (\pi) = \beta_0 + \beta_1 p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Community health centers, Ghana, Geographic information systems, Public health, Time-series analysis, Evaluation methods, Spatial epidemiology*

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