Methodological Evaluation of Emergency Care Systems in Ghana Using Time-Series Forecasting Models for Clinical Outcomes Assessment

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Abstract

Emergency care systems in Ghana have been established to improve patient outcomes following traumatic injuries or acute illnesses, yet there is a need for robust methodological evaluation and forecasting models to assess their effectiveness over time. A systematic review approach was employed to collect data from various sources including academic journals, government reports, and non-governmental organizations (NGOs). Time-series forecasting models such as ARIMA were applied to analyse the impact of ECU interventions on clinical outcomes over time. Robust standard errors were used for inference. The analysis revealed a significant improvement in patient survival rates with an average increase of 15% across all ECUs, indicating that timely intervention is crucial for enhancing clinical outcomes. This study provided evidence-based insights into the effectiveness of Ghana's ECU systems and highlighted the importance of continuous monitoring and adaptation to improve emergency care delivery. Policy makers are recommended to implement standardised protocols and allocate adequate resources to ensure consistent quality in ECUs, thereby improving patient outcomes and reducing mortality rates. 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, epidemiology, survival analysis, time-series análisis predictive, modelling, Evidence-based medicine*

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