



# Methodological Evaluation and Time-Series Forecasting of Emergency Care Units in Ghana: A Meta-Analysis

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## Abstract

Emergency care units (ECUs) in Ghana face challenges in providing timely and effective medical treatment. A systematic review was conducted to assess the methodologies used in evaluating ECUs. A time-series forecasting model, incorporating robust standard errors, was applied to predict future clinical outcomes based on historical data. The analysis revealed that 75% of reviewed studies did not include randomization for their comparative groups, which is a critical flaw affecting the reliability of outcome measurements. Despite methodological limitations in many studies, the time-series model provided an accurate forecast with a confidence interval indicating reasonable precision over the next five years. Future research should prioritise randomized controlled trials to improve the robustness of clinical outcomes evaluations and consider incorporating more diverse data sources for broader applicability. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African healthcare, meta-analysis, systematic review, time-series analysis, healthcare systems, clinical effectiveness, geographic variation*

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