



Methodological Evaluation of Emergency Care Units Systems in South Africa Using Time-Series Forecasting Models for Clinical Outcome Measurement

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Abstract

Emergency care units (ECUs) in South Africa face significant challenges related to resource allocation and service delivery, particularly during peak hours when clinical outcomes can be adversely affected. The review will employ systematic literature search techniques to identify relevant studies, with a focus on empirical data from South African ECU settings. The time-series forecasting model will be applied to analyse trends and predict future performance based on historical data. A notable theme emerged regarding the improvement in patient outcomes through optimised resource allocation strategies identified in the reviewed literature. The findings suggest that effective use of time-series forecasting models can enhance the operational efficiency and clinical outcomes of ECUs, warranting further research and implementation in practice. ECU managers should consider implementing data-driven decision-making processes to optimise resource allocation and improve patient care outcomes. Future studies should explore the scalability and impact of these strategies across different ECU settings. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African healthcare, emergency care, forecasting models, methodological evaluation, South Africa, time-series analysis, clinical outcomes

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