



# Methodological Evaluation of Emergency Care Units in Tanzania: A Multilevel Regression Analysis for Measuring Clinical Outcomes

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## Abstract

Emergency care units (ECUs) in Tanzania are critical for providing rapid medical attention to patients with life-threatening conditions. However, their effectiveness and operational efficiency vary significantly across different regions. A multilevel regression model was employed to analyse data from multiple ECUs across different regions, accounting for both unit-level and regional-level variations. Key variables included patient demographics, severity of illness, and ECU operational factors. The analysis revealed that survival rates in units with higher staffing levels were significantly improved by approximately 30%, indicating a positive impact on clinical outcomes. This study provides evidence to support the importance of adequate resource allocation for ECUs. The multilevel regression model offers a robust framework for future evaluations and policy development. Based on these findings, it is recommended that Tanzania invests in increasing staff numbers at its ECUs to enhance patient survival rates. Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_1$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, Tanzania, Multilevel, Regression, Evaluation, Quality, Access

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