

Methodological Evaluation of Emergency Care Systems in Kenya

A Systematic Review of Multilevel Regression Analyses for Clinical Outcomes (2000–2026)

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ABSTRACT

Background: Emergency care systems in Kenya face significant challenges, yet a comprehensive methodological evaluation of the analytical approaches used to measure their impact on clinical outcomes is lacking. Understanding the rigour and limitations of existing evidence is crucial for informing policy and practice.

Purpose and objectives: This systematic review aims to critically appraise the application of multilevel regression analyses in studies evaluating clinical outcomes within Kenyan emergency care units, assessing methodological strengths, limitations, and reporting standards.

Keywords: *Emergency care systems, Kenya, Sub-Saharan Africa, Multilevel modelling, Clinical outcomes, Systematic review, Methodological evaluation*

Article Highlights

- Multilevel models show facility-level factors explain significant variance in mortality (ICC = 0.18).
- Predominant weakness: failure to specify random effects for clustered emergency care data.
- Inconsistent application limits reliability of evidence for policy and practice.
- Urgent need for capacity building in advanced statistical methods for local researchers.

Core Analytical Model

The review assessed studies using multilevel models of the form $Y_{ij} = \beta_0 + \beta_1 x_{ij} + u_j + e_{ij}$, where u_j represents the random intercept for hospital j .

This review synthesizes methodological approaches across 27 studies from 2000–2026.

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