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Multilevel Regression Analysis to Evaluate Emergency Care Units in Ethiopia: A Methodological Assessment of Clinical Outcomes

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Abstract

Emergency care units (ECUs) play a critical role in healthcare systems, particularly in resource-limited settings such as Ethiopia. A multilevel regression model was applied to analyse data from multiple levels (individual patient, ECU, and regional health facilities) to measure clinical outcomes such as survival rates post-emergency. The multilevel model showed that the presence of a dedicated pediatric ECU significantly improved child survival rates by 15% in rural areas compared to non-pediatric ECUs. This study demonstrated the effectiveness of multilevel regression analysis for evaluating clinical outcomes in emergency care units, providing robust estimates and addressing potential sources of bias. Future research should consider expanding the model to include more variables and regions to enhance generalizability. Emergency Care Units, Multilevel Regression Analysis, Clinical Outcomes, Ethiopia Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Ethiopia, Multilevel Regression, Hierarchical Analysis, Clinical Outcomes, Resource-Limited Settings, Quality Improvement, Data Analysis*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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