



Methodological Evaluation of Emergency Care Systems in Senegal Using Multilevel Regression Analysis for Clinical Outcomes Assessment

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Abstract

Emergency care systems in Senegal are critical for saving lives during health crises. However, their effectiveness varies significantly across different regions and settings. The study employs a mixed-effects logistic regression model for analysing data collected from multiple ECUs. Uncertainty is quantified through robust standard errors and confidence intervals. In one region, the proportion of patients receiving timely treatment was found to be 75%, indicating room for improvement in response times. The multilevel regression analysis provides insights into how ECUs can be optimised to improve clinical outcomes and patient survival rates. Immediate attention should be given to enhancing communication protocols between hospitals, reducing response time, and increasing the availability of medical supplies. Emergency Care Systems, Senegal, Multilevel Regression, Clinical Outcomes Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, multilevel modelling, clinical outcomes, intervention studies, public health, regression analysis, resource allocation*

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