



Multilevel Regression Analysis of Clinical Outcomes in Nigerian Rural Health Clinics Systems: A Methodological Evaluation

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Abstract

Nigerian rural health clinics face challenges in delivering consistent quality care due to limited resources and infrastructure. A multilevel mixed-effects logistic regression model was employed, accounting for clinic-level and patient-level variability. Data were collected through routine medical records over a two-year period in 50 clinics across Nigeria. The multilevel regression analysis revealed that patient age ($p < 0.05$) had a significant impact on clinical outcomes, indicating an increased risk of adverse events among older patients. This study provides robust evidence for the importance of stratifying data at different levels to accurately measure and improve clinical performance in rural health settings. Rural health clinics should prioritise interventions targeting patient age groups with higher risks, such as implementing targeted health education programmes for older patients. Multilevel Regression Analysis, Nigerian Rural Health Clinics, 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: *Sub-Saharan, logistic, mixed-effects, multilevel, rural, evaluation, analytics*

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