African Occupational Medicine

Multilevel Regression Analysis to Evaluate Clinical Outcomes in Ghanaian District Hospitals Systems: A Methodological Assessment

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Abstract

Multilevel regression analysis is increasingly used to evaluate complex healthcare systems, particularly in resource-limited settings like Ghanaian district hospitals. A multilevel logistic regression model was employed to analyse data from district hospital records, considering both patient-level and hospital-level factors. Uncertainty in estimates was assessed through robust standard errors. The multilevel regression revealed that the presence of a dedicated infection control team significantly decreased hospital-acquired infections by 15% (OR: 0.85, CI: 0.78-0.93). This study provides evidence for the effectiveness of specific interventions in improving clinical outcomes in Ghanaian district hospitals. District hospital administrators should prioritise training and support for infection control teams to further reduce healthcare-associated infections. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Hierarchical, Mixed-Effects, Logistic, GeneralizedLinearModels, ResourceAccessibility*

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