



Methodological Evaluation of Public Health Surveillance Systems in Nigeria: Multilevel Regression Analysis for System Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and tracking health trends in Nigeria. However, their reliability varies across different levels of governance. A multilevel logistic regression model will be employed to assess system reliability at both national and state levels. The model will account for hierarchical data structures and potential sources of variability. The analysis revealed that the proportion of correct surveillance reports varied significantly across states, with some reporting systems having a success rate as high as 85% in detecting disease outbreaks. This study provides evidence on the reliability of Nigeria's public health surveillance systems at both national and state levels. Recommendation for policymakers is to focus on improving data quality in underperforming states through targeted interventions and training programmes. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Nigeria, Multilevel, Regression, Evaluation, Surveillance, Framework*

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