



# Methodological Evaluation of Public Health Surveillance Systems in Nigeria: A Multilevel Regression Analysis

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## Abstract

Public health surveillance systems are essential for monitoring diseases in Nigeria to prevent outbreaks and control their spread efficiently. A systematic literature review was conducted using a multilevel regression model to analyse data from various sources. The study aimed at identifying strengths and weaknesses of the surveillance systems across different levels (national, state, local). The multilevel regression analysis revealed that incorporating community engagement into surveillance protocols significantly improved disease detection rates by 20%. This review highlights the importance of multilevel approaches in strengthening public health surveillance systems. Future work should focus on implementing these findings to enhance system effectiveness. Implementing a more inclusive, community-based approach is recommended for enhancing disease detection and response capabilities. 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 Africa, public health surveillance, geographical information systems, data quality assessment, multilevel modelling, spatial analysis, regression studies*

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