



Multilevel Regression Analysis for Evaluating Cost-Effectiveness of Public Health Surveillance Systems in Nigeria: An Assessment from 2006 to 2006 Context

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Abstract

Public health surveillance systems (PHSSs) play a crucial role in monitoring diseases and managing public health emergencies in Nigeria. However, the cost-effectiveness of these systems remains underexplored. A multilevel regression model was employed to analyse data from to , with a focus on cost-effectiveness metrics such as cost per case detected and health outcomes. The analysis accounted for hierarchical structures within the PHSSs and included control variables related to system design, implementation, and environmental factors. The multilevel regression model revealed that local-level surveillance systems had a higher detection rate of infectious diseases compared to national and state levels ($p < 0.05$), suggesting an optimal balance between cost and effectiveness at this level. This study provides insights into the most effective configuration of PHSSs in Nigeria, highlighting the importance of local-level surveillance for detecting outbreaks efficiently and cost-effectively. Based on these findings, policymakers should prioritise investment and resource allocation towards enhancing local-level public health surveillance systems to improve disease detection and control efforts. Public Health Surveillance Systems, Cost-Effectiveness Analysis, Multilevel Regression Model, Nigeria Treatment effect was estimated with $\text{text}\{ \text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Nigerian, Geographic, Public Health, Surveillance, Cost-Effectiveness, Multilevel, Regression

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