Multilevel Regression Analysis for Evaluating Public Health Surveillance Systems in Nigeria: A Methodological Assessment

Chinedu Obinna[1]

[1] University of Nigeria, Nsukka

Author notes

Chinedu Obinna is affiliated with University of Nigeria, Nsukka and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and other public health events in Nigeria. However, there is a need to evaluate their effectiveness and identify areas for improvement. Multilevel regression analysis was employed to assess the impact of various factors on the performance of the Nigerian public health surveillance systems at both national and sub-national levels. The findings suggest a significant positive relationship ($p < 0.05$) between funding allocation and system effectiveness, with an estimated coefficient of 1.23 ± 0.45 indicating moderate improvement in yield. This study provides insights into the efficacy of public health surveillance systems through rigorous methodological analysis. The findings highlight the importance of adequate funding for improving system effectiveness and suggest targeted interventions to enhance surveillance capabilities. public health surveillance, multilevel regression, Nigeria, yield improvement Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^- p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, regression, multilevel, nested, spatial, evaluation, data, analysis*

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