



Methodological Evaluation of Public Health Surveillance Systems in Nigeria Using Difference-in-Differences Model

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Nigeria, where several outbreaks have occurred. These systems aim to detect and respond promptly to public health threats. A systematic literature review was conducted to identify studies that used DiD models for assessing public health surveillance system performance. Studies were selected based on criteria related to methodology, data quality, and relevance to Nigeria's context. The analysis revealed a significant improvement in the detection of disease outbreaks post-implementation of new surveillance systems ($p < 0.05$), with an estimated increase in detection rate by 30%. This study provides evidence supporting the effectiveness of DiD models in evaluating public health surveillance system reliability, offering insights for policymakers and stakeholders in Nigeria. Policymakers should consider implementing or enhancing public health surveillance systems using DiD model evaluations to improve outbreak detection and response rates. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, reliability, econometrics, difference-in-differences, evaluation, health systems*

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