



Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Difference-in-Differences for Clinical Outcomes Analysis

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Abstract

Public health surveillance systems in South Africa are crucial for monitoring and managing disease outbreaks efficiently. However, their effectiveness varies widely across different regions. The study employed a DiD approach to analyse data from multiple public health surveillance sites. The empirical analysis utilised logistic regression models with robust standard errors to account for potential confounding factors. A notable trend indicated that the DiD method improved detection rates of common infectious diseases by 15% in urban areas compared to rural settings, despite initial variability in system implementation. The DiD model provided a robust framework for evaluating public health surveillance systems and highlighted disparities between urban and rural regions. Future studies should further investigate the scalability of the DiD method across diverse scenarios and consider integrating continuous surveillance enhancements to improve detection rates overall. Public Health Surveillance, Difference-in-Differences, Clinical Outcomes, Logistic Regression, Robust Standard Errors Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, evaluation, difference-in-differences, methodology, public health, outcomes*

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