



Methodological Evaluation of Public Health Surveillance Systems in Uganda Using Difference-in-Differences Models for Measuring Risk Reduction Over Time

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks in developing countries like Uganda. A difference-in-differences (DID) model was employed to assess the impact of surveillance enhancements on disease incidence, with pre- and post-intervention data from selected districts. The DID model revealed a statistically significant decrease in measles cases by 30% ($p < 0.05$), suggesting effective risk reduction strategies implemented. The use of DID models provided robust evidence for the impact of surveillance improvements on disease incidence, contributing to better public health outcomes. Further studies should be conducted across more districts and with additional disease types to validate these findings. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta^* p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, DID model, evaluation, public health, methodology, analytical frameworks*

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