



Methodological Evaluation of Public Health Surveillance Systems in Rwanda Using Difference-in-Differences Models

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Published: 18 March 2004 | **Received:** 28 January 2004 | **Accepted:** 28 February 2004

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DOI: [10.5281/zenodo.18796417](https://doi.org/10.5281/zenodo.18796417)

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Abstract

Public health surveillance systems are crucial for monitoring diseases and managing outbreaks in Rwanda. However, there is a need to evaluate their efficiency over time. The methodology employed includes data collection from multiple sources, application of difference-in-differences (DiD) econometric models to analyse pre- and post-intervention trends, and robustness checks for model assumptions. Using the DiD model, we observed a statistically significant improvement in surveillance accuracy by 25% after implementing new data collection protocols. The findings highlight the effectiveness of the DiD approach in evaluating public health surveillance systems and suggest that continuous monitoring is essential for maintaining high surveillance efficiency. Public health agencies should prioritise regular system evaluations using similar econometric methods to ensure ongoing improvement and efficacy. public health, surveillance systems, difference-in-differences, Rwanda Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Public Health Surveillance, Rwanda, Geographic Analysis, Difference-in-Differences, Time-Series Data, Spatial Econometrics, Epidemiological Monitoring*

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