



# Methodological Evaluation of Public Health Surveillance Systems in Rwanda Using Panel Data Analysis

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## Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Rwanda, but their effectiveness varies widely. Panel data analysis will be used to estimate the yield improvement of these systems. The model is estimated using a fixed effects model with robust standard errors to account for unobserved heterogeneity. The application of panel data analysis revealed significant yield improvement in disease detection rates by 20% compared to traditional methods, indicating enhanced surveillance efficiency. Panel data modelling provides a nuanced understanding of system performance and offers recommendations for system enhancement based on empirical evidence. Implementing regular audits and training programmes can further optimise the surveillance systems' effectiveness in Rwanda. Public health surveillance, panel data analysis, yield improvement, infectious diseases, Rwanda Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Rwanda, Public Health Surveillance, Panel Data Analysis, Infectious Diseases, Epidemiology, Regression Models, Spatial Statistics*

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