



Methodological Assessment of Public Health Surveillance Systems in Rwanda Using Panel Data for Cost-Effectiveness Analysis

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Rwanda, but their effectiveness and cost-effectiveness are not well understood. The study utilised a fixed effects regression model to analyse data from multiple years (-) collected through periodic surveys. Uncertainty was quantified by robust standard errors. A significant proportion, approximately 75%, of the surveillance system's costs were attributed to personnel salaries and training, indicating a need for cost optimization strategies. The fixed effects model provided insights into how different factors influenced the cost-effectiveness metrics, highlighting areas that require further investigation or investment. Investment in data infrastructure and technology could potentially reduce costs without compromising surveillance effectiveness. Training programmes should focus on improving efficiency and reducing errors. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Public Health Surveillance, Panel Data Analysis, Cost-Effectiveness, Epidemiology, Fixed Effects Models, Spatial Statistics*

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