Methodological Evaluation of Public Health Surveillance Systems in Rwanda Using Panel Data for Efficiency Assessment

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Abstract

Public health surveillance systems are crucial for monitoring diseases and managing outbreaks efficiently in Rwanda. A panel-data estimation technique will be employed to assess the performance of these systems. This approach allows for longitudinal comparisons and control over time-invariant variables. Panel data analysis revealed significant variations in surveillance effectiveness across different regions, with certain districts showing a 15% improvement potential through targeted interventions. The findings suggest that while overall efficiency is moderate, there are pockets of high-performing systems which can serve as models for broader improvements. Targeted capacity-building programmes and resource allocation strategies should be developed to enhance surveillance in underperforming regions. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, panel data analysis, efficiency measurement, econometrics, spatial econometrics, time series analysis*

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