



Cost-Effectiveness Evaluation of Public Health Surveillance Systems in Ghana Using Panel Data Analysis: An In-depth Methodological Assessment

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Abstract

Public health surveillance systems play a crucial role in monitoring infectious diseases in Ghana. However, their cost-effectiveness varies widely among different regions and over time. A panel data regression model was employed to estimate the cost-effectiveness of surveillance systems. The specific analytical tool used is a fixed effects model with robust standard errors to account for unobserved heterogeneity across regions. The analysis revealed that certain regions benefited more from public health surveillance systems, with an estimated 30% reduction in disease prevalence over five years compared to areas without such systems. This suggests significant cost-effectiveness in targeted interventions. This study provides a robust methodological framework for evaluating the impact of public health surveillance systems in Ghana, highlighting the importance of regional specificity in system design and implementation. Based on our findings, it is recommended that additional resources be allocated to regions where surveillance systems have shown maximum benefits. Future research should also explore the scalability of these interventions across different geographical settings. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Ghanaian, econometric, panel-data, cost-benefit, surveillance, evaluation*

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