



Evaluating Public Health Surveillance Systems in Kenya: A Cost-Effectiveness Panel Data Analysis

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and managing healthcare resources in Kenya. However, their effectiveness varies significantly across regions. A cost-effectiveness panel-data estimation approach was employed to analyse data from multiple Kenyan regions. The study utilised a fixed effects model with robust standard errors for accounting for potential unobserved heterogeneity. The analysis revealed that the surveillance systems in high-density urban areas were more effective in terms of disease detection and response, with an estimated cost-effectiveness ratio (CEA) of 100 per detected case. However, lower resource investment was required in rural settings to achieve similar outcomes. $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African health systems, panel data analysis, cost-effectiveness, disease surveillance, resource allocation, econometrics, geographic information systems*

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