



# Methodological Evaluation of Public Health Surveillance Systems in Kenya: Panel Data Estimation for Efficiency Gains

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## Abstract

Public health surveillance systems in Kenya are essential for monitoring infectious diseases and managing public health emergencies. A panel-data econometric model was employed to assess the performance of Kenyan surveillance systems. The model includes fixed effects to control for unobserved heterogeneity across regions and random effects to account for time-invariant characteristics within regions. The estimated efficiency scores indicate significant variability in system performance, with some regions achieving up to 20% higher operational efficiencies than others. This study provides insights into how public health surveillance can be optimised for better resource allocation and service delivery. Policy recommendations include targeted interventions to enhance the efficiency of underperforming systems and continuous monitoring of system performance. Public Health Surveillance, Efficiency Gains, Panel Data Estimation, Kenya Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Kenya, Public Health Surveillance, Panel Data, Econometrics, Efficiency Measurement, Spatial Analysis, Spatial Econometrics

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