



# Methodological Evaluation of Public Health Surveillance Systems in Kenya: A Multilevel Regression Analysis

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## Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Kenya, but their effectiveness varies across different regions and levels of governance. A systematic literature review was conducted to identify relevant studies on public health surveillance systems in Kenya. Studies were selected based on their methodological rigor, including multilevel regression analyses that accounted for hierarchical data structures. The multilevel regression models revealed significant heterogeneity in system performance across districts ( $p < 0.05$ ), with some areas showing substantial efficiency gains attributed to improved communication and coordination mechanisms. This study provides a robust framework for evaluating public health surveillance systems, emphasising the importance of integrating district-level feedback into national policies. Health policymakers should prioritise ongoing evaluation and system improvement initiatives that leverage multilevel regression analysis to identify areas needing enhancement. 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, public health, surveillance systems, governance levels, multilevel analysis, evaluation methodologies, regression techniques

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