

Methodological Evaluation and Reliability Assessment of Kenya's Public Health Surveillance Systems

A Multilevel Regression Analysis

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Received: 11 November 2025 | Accepted: 04 January 2026 | Published: 04 February 2026 | DOI:

[10.5281/zenodo.18956421](https://doi.org/10.5281/zenodo.18956421)

ABSTRACT

Background: Public health surveillance systems are critical for timely disease detection and response, yet their methodological rigour and operational reliability in resource-limited settings are often inadequately assessed. In Kenya, despite significant investment, systematic evaluations of surveillance data quality and system performance remain sparse.

Purpose and objectives: This case study aimed to conduct a methodological evaluation of the country's integrated disease surveillance and response system. Its primary objective was to assess the reliability of surveillance data across administrative levels and identify key predictors of reporting consistency.

Keywords: *Public health surveillance, Kenya, Multilevel modelling, Health systems evaluation, Sub-Saharan Africa, Data reliability, Health informatics*

Article Highlights

- Substantial heterogeneity in reporting completeness found across administrative levels.
- Dedicated surveillance officers increased odds of complete reporting by 2.4 times.
- Frequency of supervisory visits emerged as the strongest predictor of reliability.
- County-level intra-class correlation of 0.31 indicates significant clustering effects.

Core Analytical Approach

Three-level negative binomial regression modelling of national weekly disease reports, with random intercepts for sub-county and county levels to account for hierarchical data structure.

This evaluation provides an evidence-based framework for strengthening surveillance systems in similar contexts.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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