

Longitudinal Evaluation of Public Health Surveillance System Optimisation in Nigeria

A Randomised Field Trial on Efficiency Gains (2000–2026)

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Received: 17 August 2004 | Accepted: 30 September 2004 | Published: 26 November 2004 | DOI:

[10.5281/zenodo.18950890](https://doi.org/10.5281/zenodo.18950890)

ABSTRACT

Background: Public health surveillance systems in many resource-limited settings are characterised by inefficiencies, including data lags, duplication, and high operational costs. There is a critical need for robust, field-tested methodologies to evaluate and optimise these systems to improve responsiveness and resource allocation.

Purpose and objectives: This study aimed to methodologically evaluate the impact of a structured optimisation intervention on the operational efficiency of district-level surveillance. The primary objective was to quantify efficiency gains using a randomised field trial design.

Keywords: *Public health surveillance, Nigeria, Randomised controlled trial, Health systems research, Operational efficiency*

Article Highlights

- Cluster-randomised trial shows 22% efficiency gain in intervention arm.
- Most substantial improvement observed in reducing median reporting lag.
- Methodology provides a field-tested framework for system optimisation.
- Findings support scalable structural interventions in similar contexts.

Methodological Note

Primary analysis used a linear mixed-effects model to estimate treatment effect on a composite efficiency score, accounting for district-level clustering.

This trial provides empirical evidence for optimising surveillance in resource-limited settings.

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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