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Cost-Effectiveness of Public Health Surveillance Systems in Nigeria

A Randomised Field Trial Methodological Evaluation

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ABSTRACT

Background: Public health surveillance is critical for early disease detection and response, yet evidence on the cost-effectiveness of different surveillance system designs in low-resource settings remains sparse. This gap hinders optimal resource allocation for health security.

Purpose and objectives: This case study aimed to methodologically evaluate a randomised field trial design for measuring the cost-effectiveness of two distinct public health surveillance system architectures in a real-world setting.

Keywords: *Public health surveillance, Cost-effectiveness analysis, Randomised controlled trial, Sub-Saharan Africa, Health economics, Disease detection, Nigeria*

Article Highlights

- Cluster-randomised trial compared centralised versus decentralised surveillance architectures.
- Decentralised system showed lower mean cost per confirmed case (£1,240 vs £1,850).
- Primary analysis indicated 92% probability of decentralised system being cost-effective.
- Study advocates for randomised designs in future surveillance system evaluations.

Core Finding

The randomised field trial methodology provided rigorous evidence that a decentralised, community-led surveillance architecture is highly likely to be more cost-effective in this setting.

This methodological evaluation demonstrates the feasibility of randomised designs for health system economic assessments.