

A Systematic Review of Quasi-Experimental Designs for Evaluating Yield Improvement in Kenya's Public Health Surveillance Systems, 2000–2026

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ABSTRACT

Background: Evaluating the impact of interventions within public health surveillance systems is critical for evidence-based policy. Quasi-experimental designs (QEDs) offer a practical alternative to randomised controlled trials in operational settings, yet their methodological application and rigour in assessing yield improvement in such systems require systematic assessment.

Purpose and objectives: This systematic review aims to critically appraise the application of QEDs in evaluating yield improvement within Kenya's public health surveillance systems, focusing on methodological choices, analytical robustness, and the validity of causal inferences drawn.

Keywords: *quasi-experimental design, public health surveillance, yield improvement, sub-Saharan Africa, impact evaluation, health systems research, Kenya*

Article Highlights

- Interrupted time series was the most frequently employed quasi-experimental design (52% of included studies).
- Inadequate reporting of sensitivity analyses undermines the validity of causal inferences in surveillance evaluations.
- A pressing need exists for enhanced methodological rigour and pre-specified analysis plans in this applied field.
- Capacity building in advanced causal inference methods for local researchers is identified as essential.

Key Model Specification

The review assessed the two-way fixed effects model: $Y_{it} = \beta_0 + \beta_1(\text{Treat}_i \times \text{Post}_t) + \alpha_i + \gamma_t + \varepsilon_{it}$, with robust standard errors clustered at the facility level.

This review critically appraises methodological application and analytical robustness.



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