

Methodological Evaluation and Cost-Effectiveness Forecasting in Tanzanian Public Health Surveillance Systems

A Systematic Review, 2000–2026

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ABSTRACT

Background: Public health surveillance is a cornerstone of effective disease control, yet the methodological rigour and economic efficiency of such systems in resource-limited settings remain inadequately characterised. In Tanzania, a nation facing a high burden of infectious diseases, understanding the evaluation frameworks and forecasting the cost-effectiveness of surveillance investments is critical for sustainable health policy.

Purpose and objectives: This systematic review aims to critically appraise methodological approaches used to evaluate public health surveillance systems in Tanzania and to synthesise evidence for forecasting their cost-effectiveness using time-series modelling.

Keywords: *public health surveillance, cost-effectiveness analysis, Tanzania, methodological evaluation, forecasting models, resource-limited settings, disease control*

Article Highlights

- 60% of evaluations used CDC framework, focusing on timeliness and completeness.
- Operational cost under-reporting severely constrains robust economic analysis.
- Forecasted ICER for integrated systems: \$150–\$450 per DALY averted.
- Methodological appraisals remain largely descriptive, lacking standardised economic components.

Forecasting Model

Cost-effectiveness at time t is modelled as: $CE_t = (\Delta \text{CASES}_t \times \beta) / \text{COST}_t + \epsilon_t$, with uncertainty quantified via Monte Carlo simulation.

This review underscores the critical data gaps limiting economic evaluation of 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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