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A Methodological Evaluation and Reliability Assessment of Public Health Surveillance Systems in Ethiopia

A Difference-in-Differences Modelling Approach

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ABSTRACT

Background: Public health surveillance systems are critical for disease control, yet their methodological reliability in low-resource settings is often unquantified. In Ethiopia, disparate data sources and infrastructural challenges necessitate a robust evaluation of these systems' consistency and validity to inform policy.

Purpose and objectives: This protocol details a study to methodologically evaluate the reliability of public health surveillance systems in Ethiopia. The primary objective is to quantify the consistency of reported incidence data for selected notifiable diseases across different reporting tiers and over time.

Keywords: *Public health surveillance, Sub-Saharan Africa, Methodological evaluation, Reliability assessment, Difference-in-differences modelling, Health information systems, Ethiopia*

Article Highlights

- Employs a difference-in-differences model to evaluate surveillance system reliability.
- Focuses on district-level data for three priority infectious diseases in Ethiopia.
- Aims to quantify changes in reporting completeness following a system intervention.
- Findings will inform recommendations for optimising national surveillance architecture.

Core Analytical Model

The study's inference relies on a DiD model: $Y_{dt} = \beta_0 + \beta_1 Post_t + \beta_2 Intervention_d + \delta(Post_t \times Intervention_d) + \varepsilon_{dt}$, where δ captures the differential change in reporting completeness.

This article presents a study protocol; empirical results are anticipated findings.