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A Randomised Field Trial for Reliability Assessment of Public Health Surveillance Systems in Ethiopia

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ABSTRACT

Background: Public health surveillance systems are critical for early detection and response to outbreaks, yet their operational reliability in resource-limited settings is often assumed rather than rigorously measured. This creates a significant evidence gap for system strengthening and investment.

Purpose and objectives: This case study aimed to develop and apply a novel field trial methodology to quantitatively assess the reliability of a national notifiable disease surveillance system, using acute watery diarrhoea (AWD) as a tracer condition.

Keywords: *Public health surveillance, Health systems research, Sub-Saharan Africa, Randomised controlled trial, Operational reliability, Health information systems, Ethiopia*

Article Highlights

- Overall system reliability measured at 58% for complete signal transmission.
- 30% of simulated case reports lost at district-to-region reporting interface.
- Facility type and staff training levels were significant predictors of success.
- Method provides quantifiable measure of operational fragility unseen by routine indicators.

Methodological Innovation

A randomised field trial introducing standardised simulated case reports across 60 health facilities to quantitatively assess surveillance system reliability.

This study provides a novel framework for the empirical evaluation of health information systems in resource-limited settings.