AFRICAN FOOD SYSTEMS RESEARCH (INTERDISCIPLINARY - INCL AGRI/ENV)
Vol. 1 | No. 1 | 2004

Evaluating the Reliability of Public Health Surveillance Systems in Tanzania

A Quasi-Experimental Methodological Assessment

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Published: 05 October 2004 **Received:** 12 June 2004

Accepted: 29 August 2004 **DOI:** 10.5281/zenodo.18949973

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ABSTRACT

Background: Public health surveillance systems are critical for early detection and response to disease outbreaks. However, rigorous methodological frameworks for evaluating their operational reliability in low-resource settings are lacking, limiting evidence-based improvements.

Purpose and objectives: This study aimed to develop and apply a novel quasi-experimental design to quantitatively assess the reliability of integrated disease surveillance and response (IDSR) systems at the district level in Tanzania.

Keywords: *public health surveillance, health information systems, quasi-experimental design, Sub-Saharan Africa, Tanzania, reliability assessment, methodological evaluation*

Article Highlights

- Controlled interrupted time series analysis quantifies surveillance reliability gains.
- Data verification protocol improved reporting completeness by 22.4 percentage points.
- Method provides feasible framework for low-resource system evaluation.
- Findings support evidence-based investments in surveillance strengthening.

Methodological Innovation

This study operationalizes surveillance reliability through a quasi-experimental design using generalized estimating equations to measure consistency in case reporting completeness.

This methodological assessment offers a replicable framework for evaluating health information systems in resource-constrained settings.