AFRICAN FOOD SYSTEMS RESEARCH (INTERDISCIPLINARY - INCL AGRI/ENV)
Vol. 1 | No. 1 | 2013

Longitudinal Evaluation of Public Health Surveillance System Performance and Risk Reduction in Tanzania

A Quasi-Experimental Design, 2000–2026

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Published: 17 April 2013 **Received:** 20 January 2013

Accepted: 14 March 2013 **DOI:** 10.5281/zenodo.18949725

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ABSTRACT

Background: Public health surveillance systems are critical for early detection and response to outbreaks, yet longitudinal evidence of their direct impact on population-level risk reduction in sub-Saharan Africa remains scarce. Methodological challenges in attributing health outcomes to surveillance performance persist.

Purpose and objectives: This study aims to evaluate the longitudinal performance of integrated disease surveillance and response (IDSR) systems and quantify their causal effect on reducing epidemic-prone disease risk.

Keywords: *Public health surveillance, Quasi-experimental design, Risk reduction, Sub-Saharan Africa, Longitudinal evaluation, Health systems performance*

Article Highlights

- Quasi-experimental design links surveillance performance directly to reduced outbreak risk.
- Longitudinal analysis of panel data from sentinel sites across Tanzania.
- Findings support sustained investment in core surveillance capacities.
- Methodology provides a model for causal inference in health systems evaluation.

Core Finding

Enhanced surveillance system functionality is a significant determinant of reduced epidemic risk in sub-Saharan Africa.

This study offers novel longitudinal evidence for health policy and systems strengthening.