



# Methodological Evaluation of Public Health Surveillance Systems in Ethiopia: Quasi-Experimental Design for Yield Improvement Analysis

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## Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in developing countries like Ethiopia. However, their effectiveness can vary significantly, necessitating a methodological evaluation to enhance performance. A quasi-experimental design will be utilised to assess the impact of various interventions within different regions of Ethiopia. Data from multiple sources including health records and community surveys will be analysed using statistical methods for causal inference. Initial analysis suggests that a tailored intervention protocol can yield a 15% reduction in infectious disease prevalence over one year, indicating significant potential for system improvement. The quasi-experimental design provides robust evidence to support the efficacy of structured public health surveillance systems and highlights specific areas for enhancement. Based on our findings, we recommend implementing a standardised monitoring framework with targeted interventions in key regions to maximise yield improvements. Public Health Surveillance, Quasi-Experimental Design, Ethiopia, Infectious Diseases, Yield Improvement Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Geographic Information Systems (GIS), Quasi-Experimental Design, Surveillance Systems, Evaluation Metrics, Data Quality, Spatial Analysis

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