



Quantitative Assessment of Public Health Surveillance Systems in Kenya using Panel Data Analysis for Yield Improvement Measurement

Ondiek Patrick¹, Mwanzia Julius^{1,2}, Ngugi David³, Kisii James⁴

¹ Moi University

² Pwani University

³ Department of Internal Medicine, Pwani University

⁴ Technical University of Kenya

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Correspondence: opatrick@hotmail.com

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Author notes

Ondiek Patrick is affiliated with Moi University and focuses on Medicine research in Africa.

Mwanzia Julius is affiliated with Pwani University and focuses on Medicine research in Africa.

Ngugi David is affiliated with Department of Internal Medicine, Pwani University and focuses on Medicine research in Africa.

Kisii James is affiliated with Technical University of Kenya and focuses on Medicine research in Africa.

Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of public health surveillance systems systems in Kenya: panel-data estimation for measuring yield improvement in Kenya. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of public health surveillance systems systems in Kenya: panel-data estimation for measuring yield improvement, Kenya, Africa, Medicine, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. 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: Kenya, Public Health Surveillance, Panel Data Analysis, Methodology, Evaluation, Quantitative Methods, Geographic Information Systems

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