



Methodological Evaluation of Public Health Surveillance Systems in Kenya: A Randomized Field Trial for Measuring Risk Reduction

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Abstract

Public health surveillance systems in Kenya are crucial for monitoring infectious diseases to prevent outbreaks. However, their effectiveness and reliability need methodological evaluation. A randomized controlled trial was conducted across three districts in Kenya to assess the performance of surveillance systems. Data on disease incidence and system response times were collected over one year. The system showed a 15% reduction in reported infectious diseases compared to historical data, with response times averaging within 24 hours for most cases. While promising, the study highlights areas needing improvement in real-world implementation and suggests further research is required. Public health officials should prioritise training for surveillance staff and continuous system maintenance to enhance efficiency and effectiveness. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African health systems, Geographic mapping, Randomization theory, Surveillance effectiveness, Validation studies, Public health metrics, Data quality assurance*

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