



Methodological Evaluation of Public Health Surveillance Systems in Uganda: A Randomized Field Trial for Efficiency Gains

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Abstract

Public health surveillance systems in Uganda are critical for monitoring infectious diseases such as malaria and tuberculosis (TB). However, their effectiveness can be improved through methodological enhancements. The study employed a two-stage cluster-randomized design, where clusters (communities) were randomly assigned into control or intervention groups. Data collection included surveys and electronic health record reviews. Statistical analyses used logistic regression models with robust standard errors for inference. In the intervention group, there was an observed reduction of 20% in malaria incidence rates compared to the control group ($p < 0.05$). The randomized field trial demonstrated significant efficiency gains through targeted interventions in surveillance systems. Public health authorities should prioritise implementation of these findings, including expanding surveillance coverage and enhancing data quality. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, evaluation, methodology, efficiency, randomized, trial*

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