



# Reliability Assessment of Public Health Surveillance Systems in Ghana: A Randomized Field Trial

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## Abstract

Public health surveillance systems are critical for monitoring infectious diseases in developing countries like Ghana. However, their reliability and effectiveness have not been thoroughly evaluated. A randomized field trial was conducted with 100 healthcare facilities across Ghana, randomly assigned into two groups: intervention (enhanced surveillance) and control (standard surveillance). System reliability was measured by analysing data from both groups over a six-month period. Statistical models were used to assess system performance. The analysis revealed that the enhanced surveillance group had an 85% higher detection rate of infectious diseases compared to the standard group, with a 95% confidence interval (CI) for this difference. This study demonstrated that enhancing public health surveillance systems can significantly improve their reliability in detecting and responding to infectious disease outbreaks. The findings suggest potential improvements in system design and resource allocation. Healthcare facilities should prioritise the implementation of enhanced surveillance systems, including training for staff on new protocols and investment in necessary infrastructure. 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, Geographic Information Systems, Sampling, Validation, Evaluation, Randomization, Surveillance*

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