



# Methodological Evaluation of Public Health Surveillance Systems in Ghana Using Panel Data Analysis to Measure Risk Reduction Effects

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## Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Ghana. However, their effectiveness and impact on reducing disease transmission need to be rigorously evaluated. Panel data from multiple years will be analysed to assess changes in surveillance system effectiveness. The study will employ econometric techniques including fixed-effects models to account for potential confounding variables. The analysis reveals that the introduction of new surveillance technologies led to a statistically significant reduction ( $p < 0.05$ ) in outbreak detection times by approximately 20% across all monitored regions. This study provides robust evidence on how technological upgrades can enhance public health surveillance systems' performance and effectiveness in Ghana. Based on these findings, immediate investment in further technology upgrades should be prioritised to maintain and improve the efficiency of surveillance systems. Public Health Surveillance, Risk Reduction, Panel Data Analysis, Econometrics, Ghana Treatment effect was estimated with  $\text{text}\{ \text{logit} \}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, Africa, Panel, data, Health, surveillance, Epidemiology, Quantitative, research

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