



Methodological Evaluation of Public Health Surveillance Systems in Tanzania: Panel Data Estimation for Risk Reduction Analysis

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Abstract

Public health surveillance systems are essential for monitoring disease prevalence and guiding intervention strategies in Tanzania. A mixed-methods approach combining quantitative analysis with qualitative insights was employed. Panel data were collected from multiple sources including government records and community surveys to estimate the impact of surveillance systems on risk reduction. The analysis revealed a significant positive correlation between enhanced public health surveillance and reduced incidence rates of malaria by 15% in rural areas, suggesting effective preventive measures. Public health surveillance systems play a crucial role in mitigating health risks, particularly for infectious diseases like malaria. The findings support the continued investment in these systems to achieve further improvements. Policy recommendations include strengthening data collection and analysis infrastructure, promoting collaboration between stakeholders, and expanding coverage in underserved regions. Public Health Surveillance, Risk Reduction, Panel Data Analysis, Malaria, Tanzania 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: Tanzania, Public Health Surveillance, Panel Data, Epidemiology, Quantitative Methods, Qualitative Research, Risk Assessment

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