



Methodological Evaluation of Public Health Surveillance Systems in Tanzania Using Multilevel Regression Analysis for Cost-Effectiveness Assessment

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Abstract

Public health surveillance systems in Tanzania are crucial for monitoring infectious diseases such as malaria and tuberculosis. However, their effectiveness varies across different regions and healthcare settings. The study will employ multilevel regression analysis to assess the impact of various factors on surveillance system performance. Data from multiple regions will be collected through surveys and existing records. Data analysis revealed significant variations in surveillance effectiveness depending on geographical location, with urban areas showing higher compliance rates compared to rural settings. This suggests that tailored interventions may be necessary for different contexts. The multilevel regression approach provides a robust framework for understanding the complex interplay of factors affecting public health surveillance systems in Tanzania. Based on findings, it is recommended that targeted training programmes are implemented in rural areas to enhance compliance and effectiveness. Additionally, financial support should be allocated more equitably across regions. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, Public Health Surveillance, Multilevel Regression, Cost-Effectiveness, Geographic Information Systems, Disease Monitoring, Epidemiology

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