



# Methodological Evaluation of Public Health Surveillance Systems Adoption in Tanzania Using Difference-in-Differences Analysis

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## Abstract

Public health surveillance systems are critical for monitoring disease outbreaks and ensuring effective public health responses in developing countries like Tanzania. A difference-in-differences (DiD) model was employed to assess changes in system adoption over time compared to a control group. This approach allowed for an evaluation of the impact of policy interventions without relying on longitudinal data from all regions. The DiD analysis revealed that public health surveillance systems showed significant increases in adoption rates, particularly in urban areas where implementation support was provided. Public health surveillance system adoption in Tanzania has been positively influenced by targeted policy measures and supportive infrastructure development. Future research should focus on scalability of the observed improvements to rural settings and exploring ways to enhance continuous monitoring mechanisms. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^* p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Tanzania, Public Health Surveillance, Difference-in-Differences, Geographic Information Systems, Spatial Analysis, Data Quality Assessment, Evaluation Metrics*

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