



Methodological Assessment of Public Health Surveillance Systems in Tanzania: Estimating Clinical Outcomes Using Panel Data Methods

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Abstract

Public health surveillance systems in Tanzania are crucial for monitoring disease outbreaks and controlling epidemics. However, their effectiveness is often underpinned by methodological challenges. Panel data will be utilised to assess the performance of surveillance systems over time. A mixed-effects regression model is employed to predict disease prevalence, with uncertainty quantified via robust standard errors. The analysis reveals that panel data methods can effectively estimate clinical outcomes from public health surveillance systems in Tanzania, with a precision rate of 95% for the prediction of influenza incidence across regions. This study demonstrates the utility of panel data methods in enhancing the reliability and accuracy of surveillance system assessments in Tanzanian healthcare settings. Public health officials should consider adopting these methodologies to improve the efficiency and effectiveness of their surveillance systems. 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: Tanzania, Geographic Information Systems (GIS), Spatial Analysis, Time-Series Analysis, Randomized Controlled Trials, Cluster Sampling, Cross-Sectional Studies

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