



Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Panel Data for System Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and managing public health crises efficiently in Ethiopia. A panel-data regression model was employed to assess the reliability of the surveillance system. The robust standard errors were calculated using clustered standard errors approach. The estimated coefficient for the lagged dependent variable revealed a positive and statistically significant relationship, indicating that past performance influenced current system effectiveness ($\beta = 0.85, p < 0.01$). This study provides evidence supporting the reliability of public health surveillance systems in Ethiopia. Enhanced investment in training for staff and modernization of infrastructure is recommended to further improve system performance. Public Health Surveillance, Panel Data Analysis, System Reliability, Robust Standard Errors Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Public health surveillance, Panel data analysis, System reliability, Epidemiology, Regression modelling, Geographic information systems (GIS)*

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