



Methodological Evaluation of Public Health Surveillance Systems in Uganda: Panel Data Estimation for System Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and ensuring timely interventions in Uganda. However, their effectiveness varies across different regions. A mixed-method approach was employed to analyse data from two Ugandan districts over a five-year period, estimating system reliability with a linear regression model and accounting for uncertainty through robust standard errors. There were significant variations ($p < 0.05$) in the accuracy of surveillance reporting between urban and rural areas, indicating disparities that require targeted interventions to improve system reliability. The study highlights the importance of implementing standardised protocols and regular training for health workers to enhance surveillance efficiency. Ugandan policymakers should prioritise resource allocation towards strengthening surveillance systems in underserved regions. 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: *Sub-Saharan, African, Spatial, Dynamics, Panel, Validity, Reliability*

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