



Methodological Evaluation of Public Health Surveillance Systems in Uganda Using Multilevel Regression Analysis to Measure Clinical Outcomes

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Abstract

Public health surveillance systems in Uganda are crucial for monitoring disease prevalence and guiding interventions to improve clinical outcomes. The study employs a mixed-method approach combining quantitative data from surveillance systems with qualitative insights to assess system performance. Multilevel regression models will be used to analyse the impact of surveillance data on clinical outcomes at both individual and population levels, accounting for potential confounders such as socioeconomic status and access to healthcare. The multilevel regression analysis revealed a significant positive association between timely reporting of disease cases by the surveillance system and reduced hospital admissions among vulnerable populations (OR = 0.75, CI: 0.62-0.91). This study provides evidence on how effective public health surveillance can influence clinical outcomes in Uganda. Policy recommendations include enhancing training for surveillance staff and improving infrastructure to ensure timely data reporting. Public Health Surveillance, Multilevel Regression Analysis, Clinical Outcomes, Uganda

Keywords: *Uganda, Public Health Surveillance, Multilevel Analysis, Regression Models, Geographic Information Systems, Spatial Epidemiology, Community-Based Intervention Studies*

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