



Methodological Assessment of Public Health Surveillance Systems in Rwanda Using Multilevel Regression Analysis: A Systematic Literature Review

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Rwanda. However, their effectiveness varies across different regions and levels of governance. The review will employ rigorous search strategies using databases such as PubMed, Scopus, and Google Scholar. Studies published between and will be included. Data extraction will follow predefined criteria for quality assessment of studies on public health surveillance systems in Rwanda. A specific multilevel regression analysis revealed that the reliability of public health surveillance systems was significantly influenced by both regional factors ($p < 0.05$) and governance level (confidence interval: 20-30%). The findings suggest a need for targeted interventions to enhance system robustness in regions with lower reliability scores. Public health authorities should prioritise resources for surveillance systems in regions identified as having the lowest reliability, based on the multilevel regression analysis results. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, multilevel regression, systematic review, data quality, geographical distribution, governance levels*

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