



Methodological Evaluation of Public Health Surveillance Systems in Rwanda: A Quasi-Experimental Design for System Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Rwanda. However, their reliability and effectiveness remain uncertain due to a lack of systematic evaluation. A quasi-experimental design was employed, comparing pre- and post-intervention data from two randomly selected regions. Statistical analysis will employ regression models to assess the impact of interventions on surveillance outcomes. The preliminary results indicate a $R^2=0.75$ in explaining variations in surveillance accuracy between intervention and control groups. This quasi-experimental approach provides robust evidence for system reliability, enabling targeted improvements to ensure timely public health responses. Systematic reviews should be conducted annually to monitor ongoing performance and inform necessary adjustments.

Keywords: *Rwanda, Geographic Information Systems (GIS), Public Health Surveillance, Quasi-Experimental Design, Evaluation Metrics, Data Quality Assurance, Spatial Analysis*

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