



# Methodological Evaluation of Public Health Surveillance Systems in Rwanda: A Quasi-Experimental Design Study

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## Abstract

Public health surveillance systems are essential for monitoring diseases and outbreaks in Rwanda. However, their effectiveness varies widely, necessitating a methodological evaluation to improve their performance. A mixed-methods quasi-experimental design was employed. The quantitative component used logistic regression models with robust standard errors to assess system performance, while qualitative interviews explored system strengths and weaknesses. The logistic regression analysis revealed that the new surveillance system significantly improved detection rates of notifiable diseases by a factor of 1.3 (95% CI: 1.1-1.6) compared to the previous system. The quasi-experimental design successfully identified yield improvements in the public health surveillance systems, providing evidence for system upgrades and resource allocation strategies. Implementing the findings from this study can lead to more effective disease monitoring and control measures in Rwanda. Quasi-Experimental Design, Public Health Surveillance, Logistic Regression, Yield Improvement Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, public health surveillance, quasi-experimental design, evaluation methods, outcome measurement, geographical epidemiology, spatial analysis*

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