



Methodological Assessment and Forecasting Models of Public Health Surveillance Systems in Rwanda,

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Rwanda. However, their effectiveness varies significantly across different regions and time periods. The study employed a systematic review approach to analyse data from various sources, including national disease surveillance reports. Time-series analysis was used to forecast the impact of interventions on disease prevalence. A significant decline in measles incidence was observed after implementation of vaccination programmes, with an average reduction rate of 35% over two years. The findings suggest that timely and effective public health surveillance can significantly reduce disease burden. The developed forecasting models provide valuable insights for future interventions. Investment in robust data collection mechanisms and continuous training of healthcare workers are essential to maintain the efficiency and effectiveness of surveillance systems. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Public health, surveillance systems, Rwanda, geographical assessment, time-series analysis, forecasting models, geographic information systems, spatial-temporal methods*

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