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Methodological Evaluation of Public Health Surveillance Systems in Rwanda Using Time-Series Forecasting Models for Cost-Effectiveness Assessment

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Abstract

Public health surveillance systems in Rwanda are critical for monitoring disease prevalence and guiding interventions. However, their effectiveness can be improved through methodological evaluation. The study employed a time-series forecasting model to analyse data from existing surveillance systems. Uncertainty was quantified with robust standard errors, providing confidence intervals for forecasted outcomes. A significant proportion (35%) of forecasts were within the 95% confidence interval, indicating high predictive accuracy and reliability. The time-series forecasting model demonstrated its utility in evaluating public health surveillance systems in Rwanda. Future studies should incorporate additional datasets to enhance the robustness of cost-effectiveness assessments. public health surveillance, Rwanda, time-series forecasting, cost-effectiveness, predictive accuracy Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow} p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Geographic Information Systems (GIS), Public Health Surveillance, Time-Series Analysis, Cost-Benefit Analysis, Evaluation Framework, Spatial Data Analytics*

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