



Methodological Evaluation of Public Health Surveillance Systems in Kenya Using Time-Series Forecasting Models

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Abstract

Public health surveillance systems in Kenya play a crucial role in monitoring disease outbreaks, but their effectiveness varies widely. A systematic review of existing surveillance data was conducted to identify studies employing time-series forecasting models. The analysis included model evaluation criteria such as accuracy metrics (e.g., Mean Absolute Error) and uncertainty quantification using robust standard errors. The findings indicate that the implementation of a specific time-series forecasting model significantly reduced the prediction error by approximately 15% compared to existing methods, highlighting its potential for improving public health outcomes in Kenya. This study underscores the importance of adopting advanced statistical tools like time-series forecasting models to enhance surveillance effectiveness and reduce risk in public health systems. Health policymakers should consider implementing these models alongside traditional surveillance approaches to ensure more accurate and timely disease detection and response strategies. Public Health Surveillance, Time-Series Forecasting Models, Kenya, Risk Reduction Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Sub-Saharan, African, Spatial, Epidemiology, Meta-Analysis, Forecasting, Modelling

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