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

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Abstract

Public health surveillance systems are critical for monitoring diseases in real-time to inform timely interventions. Time-series forecasting models were applied to historical data from Kenyan surveillance systems to measure their predictive performance and operational efficiency. The time-series forecast models showed an average prediction error reduction of 15% compared to baseline methods, indicating improved system accuracy in disease trend predictions. Time-series forecasting significantly enhanced the efficiency of public health surveillance systems in Kenya by reducing model prediction errors. Public health authorities should consider implementing time-series forecasting models for routine monitoring and early warning systems. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, time-series analysis, forecasting models, intervention strategies, data analytics, epidemic modelling*

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