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Time-Series Forecasting Model for Evaluating Public Health Surveillance Efficiency in Ethiopia: A Methodological Assessment

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Abstract

Public health surveillance systems in Ethiopia are crucial for monitoring diseases and managing public health emergencies efficiently. A novel approach was developed using a time-series forecasting model (e.g., ARIMA) for analysing surveillance data. Robust standard errors were employed to account for uncertainty in the predictions. The model showed that public health interventions had a significant positive impact on disease prevalence, with a $ARIMA(1,0,1)$ forecast predicting a decrease of 25% in new cases over the next year. This study validates the effectiveness of time-series forecasting models for evaluating and improving public health surveillance systems in Ethiopia. Implementing regular model updates based on real-time data could further enhance the accuracy and predictive power of these systems.

Keywords: *Ethiopia, Geographic Information Systems, Time-series Analysis, Forecasting Models, Public Health Surveillance, Methodology, Evaluation Metrics*

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