



Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Time-Series Forecasting Models for System Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring disease prevalence and guiding healthcare resource allocation in developing countries like Ethiopia. A review of existing surveillance data from Ethiopia was conducted. Time-series forecasting models were applied to assess system performance and identify potential improvement areas. The analysis revealed a consistent upward trend in disease prevalence over the past decade, with an estimated annual increase rate of 2.5% (95% CI: 2.0-3.0%). Time-series forecasting models can effectively measure system reliability and inform targeted interventions to enhance surveillance accuracy. Regular data updates and model recalibration are recommended for continuous improvement in public health surveillance systems. Public Health Surveillance, Time-Series Forecasting, Reliability Assessment, Ethiopia Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Ethiopia, Geographic Information Systems (GIS), Public Health Surveillance, Time-Series Analysis, Forecasting Models, System Reliability, Data Accuracy

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