



A Methodological Evaluation of Public Health Surveillance Systems in Ethiopia

A Time-Series Forecasting Model for Adoption Rate Measurement, 2000–2026

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ABSTRACT

Background: Public health surveillance systems are critical for disease control, yet robust methodologies for evaluating their adoption and long-term performance in low-resource settings are lacking. Ethiopia has implemented several such systems, but their sustained uptake and operational efficiency require formal assessment.

Purpose and objectives: This case study aimed to develop and apply a novel time-series forecasting model to methodologically evaluate the adoption trajectory of key public health surveillance systems in Ethiopia, providing a replicable framework for performance measurement.

Keywords: *Public health surveillance, Ethiopia, Time-series analysis, Forecasting model, Adoption rate, Sub-Saharan Africa, Health systems evaluation*

Article Highlights

- Forecasting model reveals adoption rate deceleration, plateauing at 67% coverage.
- Identifies infrastructural constraints and training gaps as primary determinants.
- Provides a replicable quantitative framework for surveillance system evaluation.
- Recommends targeted refresher training and peripheral infrastructure investment.

Methodological Contribution

A hybrid ARIMA model with intervention analysis offers a rigorous alternative to descriptive metrics for evaluating surveillance system performance in low-resource settings.

This study presents a novel forecasting framework for evaluating health system adoption trajectories.



ABSTRACT-ONLY PUBLICATION

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