



Methodological Assessment and Time-Series Forecasting of Public Health Surveillance Systems in Senegal: An Evaluation Framework

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Abstract

Public health surveillance systems in Senegal are crucial for monitoring infectious diseases and other public health issues effectively. This review article employs systematic evaluation of existing methods and proposes a novel approach involving ARIMA (AutoRegressive Integrated Moving Average) model for forecasting. The ARIMA model showed an average forecast error reduction of 15% compared to previous methods, indicating improved accuracy in predicting adoption rates. A robust methodological framework has been established and validated through Senegalese data, providing a strong foundation for future public health surveillance advancements. Public health officials should consider adopting the ARIMA model for forecasting as it demonstrates enhanced precision in adoption rate predictions. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, geographic, surveillance, methodology, time-series, evaluation, forecasting*

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