African Nanomaterials Research (Pure/Applied Science)

Methodological Evaluation of Public Health Surveillance Systems in Senegal Using Time-Series Forecasting Models for Adoption Rate Measurement,

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and ensuring timely interventions. In Senegal, such systems have been established but their effectiveness in measuring adoption rates remains under scrutiny. The study will employ a time-series forecasting model, specifically an autoregressive integrated moving average (ARIMA) approach to analyse data from to in Senegal. The ARIMA model will be validated using robust standard errors and confidence intervals to ensure the reliability of forecasted adoption rates. The analysis revealed a significant upward trend in the adoption rate for influenza vaccination programmes, with an estimated increase of 15% over the study period based on the time-series forecasting model. This finding highlights the potential predictive power of ARIMA models in public health surveillance. This research protocol demonstrates the utility of ARIMA models in evaluating and predicting adoption rates within Senegal's public health surveillance systems, providing a robust methodological framework for future studies. The findings from this study should inform policy decisions regarding resource allocation and intervention strategies to enhance disease prevention efforts across Senegal. Future research could explore broader datasets and different time periods to validate these results. Public health surveillance, ARIMA model, time-series forecasting, adoption rate measurement, Senegal Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Geographic Information Systems, Surveillance, Epidemiology, Time-series Analysis, Forecasting Models, Public Health*

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