Methodological Assessment of Public Health Surveillance Systems in South Africa through Time-Series Forecasting Models

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Abstract

Public health surveillance systems in South Africa play a crucial role in monitoring infectious diseases. However, their effectiveness can be assessed through time-series forecasting models to predict future trends and improve public health outcomes. A comprehensive literature search was conducted, focusing on studies published between and . Eligible studies were selected based on predefined inclusion criteria, including the use of time-series forecasting models to evaluate public health surveillance systems in South Africa. Findings indicate that while some studies used ARIMA models for forecasting, there was a need for more robust statistical methods such as SARIMAX (Seasonal AutoRegressive Integrated Moving Average with eXogenous regressors) to capture seasonal variations and external factors affecting public health surveillance systems in South Africa. The review highlights the importance of methodological rigor in evaluating public health surveillance systems through time-series forecasting models, particularly for improving yield improvement analyses. Future research should focus on integrating more sophisticated statistical models like SARIMAX to enhance the accuracy and reliability of forecasts in South African public health surveillance systems. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\top}p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, geographical, surveillance, forecasting, methodology, evaluation, analytics*

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