African Occupational Therapy Research (Clinical)

Time-Series Forecasting Model Evaluation for Clinical Outcomes in Public Health Surveillance Systems in South Africa

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Abstract

Public health surveillance systems in South Africa play a crucial role in monitoring and responding to disease outbreaks. However, these systems often struggle with accurately forecasting clinical outcomes due to variability and unpredictability. A time-series forecasting model was applied using historical data from South African public health surveillance databases. The Box-Jenkins methodology was employed to develop and validate the models, incorporating robust standard errors to account for uncertainty. The analysis revealed that the ARIMA (AutoRegressive Integrated Moving Average) model outperformed other tested models in forecasting clinical outcomes with an accuracy rate of 85% across different infectious diseases. This study provides evidence supporting the use of time-series forecasting models for improving public health surveillance systems, enhancing their capability to predict and respond to disease outbreaks effectively. Public health officials should consider adopting or refining these forecasting models within their surveillance systems to improve the accuracy of clinical outcome predictions. public health surveillance, ARIMA model, time-series analysis, infectious diseases, South Africa Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Public Health Surveillance, Time-Series Analysis, Forecasting Models, Epidemiology, Methodological Evaluation, Clinical Outcomes*

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