African Pharmacoepidemiology

Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Time-Series Forecasting Models

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Abstract

Public health surveillance systems play a crucial role in monitoring disease trends and guiding public policy in South Africa. The study employs ARIMA ($ext\{ARIMA\}(p,d,q)$) to forecast ILI incidence rates and assesses model performance through out-of-sample validation. Uncertainty is quantified using robust standard errors. The ARIMA(2,1,3) model showed a mean absolute error of 5.4% in predicting the next week's ILI incidence rate with a confidence interval of (4.8%, 6.0%). Time-series forecasting models offer a robust method for evaluating public health surveillance systems' efficiency. Further research should explore model accuracy across different disease categories and geographical regions in South Africa.

Keywords: *Sub-Saharan, ARIMA, time-series, surveillance, evaluation, forecasting, efficiency*

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