African Cardiovascular Surgery

Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Time-Series Forecasting Models: A Systematic Literature Review

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Abstract

Public health surveillance systems in South Africa are crucial for monitoring disease trends and guiding policy decisions. However, their effectiveness can be improved through methodological evaluation. A systematic literature review was conducted, encompassing studies published between and . The methodology evaluation focused on model selection criteria, data preprocessing techniques, and the application of time-series forecasting models to predict disease trends. The analysis revealed that while some systems used ARIMA models effectively for short-term forecasting (direction: positive), others lacked robust validation procedures leading to overfitting issues (proportion: 40%). This review highlights the need for improved methodological rigor in public health surveillance systems, particularly in model selection and validation. Enhancement of methodological practices is recommended, with a focus on validating models using independent data sets to ensure their reliability and predictive power. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African, Geographic, Methodology, Public Health, Surveillance, Time-Series, Evaluation*

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