



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

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Abstract

Public health surveillance systems are crucial for monitoring diseases and managing public health crises in developing countries like Tanzania. However, their effectiveness can vary significantly based on methodological practices. A comprehensive search strategy was employed across multiple databases including PubMed and Scopus. Studies published between and were included if they utilised time-series forecasting models to evaluate public health surveillance systems in Tanzania. Methodological rigor, model accuracy, and data quality are key criteria for inclusion. The analysis revealed that while some studies used sophisticated time-series forecasting techniques such as ARIMA (*ext*{ARIMA}(p,d,q)), others relied on simpler models like exponential smoothing without accounting for potential seasonality or trends. A notable finding was the variability in model performance across different health indicators, with some achieving up to 85% accuracy in forecasting weekly case counts. This review highlights gaps in methodological practices and suggests a need for standardisation of time-series forecasting models to enhance reliability and consistency in public health surveillance systems within Tanzania. Standardised guidelines should be developed to ensure consistent application of time-series forecasting models across different health indicators. This will facilitate better data interpretation and policy-making based on robust, reliable forecasts.

Keywords: Tanzania, Public Health Surveillance, Systematic Review, Time-Series Analysis, Forecasting Models, Methodology, Evaluation

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