African Ceramics Research (Applied Science/Tech)

Forecasting Clinical Outcomes in Kenya's Public Health Surveillance Systems Using Time-Series Analysis

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Abstract

Public health surveillance systems in Kenya are essential for monitoring disease prevalence and guiding public health interventions. However, their effectiveness can be enhanced through advanced forecasting models that predict clinical outcomes based on historical data. A seasonal autoregressive integrated moving average (SARIMA) model was applied to historical data from Kenya's national disease surveillance system. The model incorporates seasonality and trends to forecast upcoming clinical outcomes with a focus on influenza-like illness incidence rates. The SARIMA model predicted an increase in the incidence of influenza-like illnesses by approximately 10% over the next six months, providing healthcare planners with actionable insights for resource allocation and intervention planning. This study validates the use of time-series forecasting models as a valuable tool for enhancing public health surveillance systems in Kenya. The model's accuracy offers a robust method for predicting clinical outcomes, improving response times to disease outbreaks. Healthcare authorities should integrate SARIMA forecasts into their routine monitoring and planning processes to better anticipate and mitigate the impact of infectious diseases. Public Health Surveillance, Time-Series Analysis, Influenza-like Illnesses, Forecasting Models Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Time-series analysis, Epidemiology, Forecasting models, Public health surveillance, Clinical outcomes, Geographic epidemiology*

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