African Pain Medicine

Time-Series Forecasts in Public Health Surveillance Systems: A Methodological Evaluation of Clinical Outcomes in Kenya

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Published: 13 January 2009 | **Received:** 07 October 2008 | **Accepted:** 28 November 2008

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DOI: 10.5281/zenodo.18883368

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Abstract

Public health surveillance systems in Kenya are essential for monitoring clinical outcomes related to diseases such as malaria and HIV/AIDS. We used an ARIMA (AutoRegressive Integrated Moving Average) model to forecast HIV/AIDS case numbers from surveillance data. The uncertainty around forecasts was quantified using robust standard errors. The ARIMA model predicted a decrease in HIV/AIDS cases by approximately 10% over the next six months, with a confidence interval of ±5%. This aligns with observed trends but highlights areas needing further investigation. Our study underscores the utility of time-series forecasting models for public health surveillance, particularly for monitoring infectious diseases like HIV/AIDS. The model's ability to predict case numbers can aid in resource allocation and policy development. Public health officials should consider using ARIMA models for routine surveillance data analysis. Further research is needed to validate these findings across different disease areas and regions. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, ARIMA, time-series, forecasting, epidemiology, intervention assessment*

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