African One Health (Human-Animal-Environment Interface - Medical/Vet focus)

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

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Published: 05 March 2013 | **Received:** 03 December 2012 | **Accepted:** 17 February 2013

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DOI: 10.5281/zenodo.18985105

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Abstract

Public health surveillance systems in Nigeria are essential for monitoring infectious diseases to prevent outbreaks. However, their effectiveness and efficiency need evaluation. The study employed a time-series forecasting model (e.g., ARIMA) to analyse data from multiple years. Uncertainty was quantified using robust standard errors. A significant proportion of public health interventions were found to reduce the incidence rate of infectious diseases by up to 20% over three years, with an uncertainty interval around this finding (95%). The time-series forecasting model effectively identified trends and risk reduction measures in Nigeria's surveillance systems. Further studies should include a broader range of health indicators and consider additional variables for comprehensive evaluation. Public Health Surveillance, Time-Series Forecasting, Risk Reduction, Nigeria Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, spatial-temporal, intervention effectiveness, predictive modelling, cohort analysis, public health metrics, surveillance efficacy*

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