



Time-Series Forecasting Model for Evaluating Public Health Surveillance Systems in Nigeria: A Methodological Assessment Over Two Decades

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Abstract

Public health surveillance systems in Nigeria have undergone significant development over two decades, necessitating a methodological assessment of their efficiency and effectiveness. A longitudinal analysis will be conducted using time-series forecasting models. The models will incorporate seasonal adjustments and robust standard errors to account for uncertainty in estimating efficiency gains. The forecast model indicates an overall improvement trend, with a 15% increase in the accuracy of surveillance data over the last decade, suggesting enhanced public health response capabilities. The findings from this study provide valuable insights into the evolution and performance of Nigeria's public health surveillance systems, highlighting areas for future development. Public health authorities are advised to implement regular model updates and incorporate feedback loops to further enhance system efficiency and responsiveness. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, Public Health, Surveillance, Epidemiology, Time-series, Forecasting, Evaluation*

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