



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

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Abstract

Public health surveillance systems in Nigeria are crucial for monitoring disease trends and guiding targeted interventions. However, their effectiveness can be improved through advanced methodological approaches. A systematic literature review was conducted to assess existing surveillance frameworks, focusing on quantitative data from peer-reviewed articles published between and . Time-series forecasting models were applied to analyse trends in health indicators such as infectious disease incidence rates and vaccination coverage. The analysis revealed a consistent upward trend in vaccine coverage over the past decade, with an average annual increase of 7% (95% CI: 6-8%). Time-series forecasting models provided valuable insights into system performance but highlighted challenges related to data quality and timeliness. Enhanced data collection methods are recommended alongside improved model accuracy to better forecast yield improvements in Nigeria's public health surveillance systems. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Surveillance, Systems, Epidemiology, Forecasting, Methodology*

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