



# Methodological Evaluation of Public Health Surveillance Systems in Nigeria: Time-Series Forecasting for Yield Improvement Analysis

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## Abstract

Public health surveillance systems in Nigeria are essential for monitoring infectious diseases and managing public health emergencies. However, their effectiveness in predicting yield improvements is not well understood. A time-series forecasting model will be applied to historical data from Nigeria's public health surveillance system. The model will include an autoregressive integrated moving average (ARIMA) equation, with uncertainty estimated through robust standard errors. The ARIMA model forecasts a positive trend in yield improvement over the next five years, indicating potential for sustained improvements if implemented effectively. This study highlights the need for continuous evaluation and optimization of public health surveillance systems to enhance their predictive capabilities and contribute to agricultural yield improvements. Public health officials should consider implementing robust data collection methods and regularly updating forecasting models to ensure accuracy and relevance in predicting yield improvement. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, surveillance, forecasting, econometrics, infectious diseases, public health, time-series analysis*

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