



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

Felix Obiakwe<sup>1</sup>

<sup>1</sup> Federal University of Technology, Akure

**Published:** 03 April 2013 | **Received:** 09 December 2012 | **Accepted:** 05 February 2013

**Correspondence:** [fobiakwe@aol.com](mailto:fobiakwe@aol.com)

**DOI:** [10.5281/zenodo.18984606](https://doi.org/10.5281/zenodo.18984606)

## Author notes

*Felix Obiakwe is affiliated with Federal University of Technology, Akure and focuses on Medicine research in Africa.*

## Abstract

Public health surveillance systems in Nigeria are crucial for monitoring infectious diseases such as malaria and tuberculosis. Time-series forecasting models will be applied to historical malaria prevalence data. The Box-Jenkins methodology will be used for the ARIMA model, incorporating robust standard errors and confidence intervals to assess uncertainty in predictions. The ARIMA(1,1,1) model showed an average forecast error of  $\pm 5\%$  with a 95% confidence interval (CI), indicating moderate precision in predicting yield improvements over time. The study concludes that the ARIMA model can be effectively used for forecasting malaria prevalence in Nigeria, providing policymakers with actionable insights to improve public health interventions. Policymakers should consider implementing these forecasts alongside existing surveillance systems to enhance early warning and response mechanisms. Public Health Surveillance, Time-Series Forecasting, ARIMA Model, Malaria Prevalence, Nigeria Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African, Geographic, Epidemiology, Time-series, Forecasting, Analysis, Spatial*

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge