



# Methodological Evaluation and Time-Series Forecasting for Assessing the Reliability of Public Health Surveillance Systems in Kenya

Wanjiku Mwangi<sup>1</sup> · Omondi Okoth<sup>1,2</sup>

<sup>1</sup> Technical University of Kenya

<sup>2</sup> Department of Epidemiology, Pwani University

Correspondence: [wmwangi@outlook.com](mailto:wmwangi@outlook.com)

Published: 14 May 2003	Received: 15 March 2003	Accepted: 23 April 2003	DOI: <a href="https://doi.org/10.5281/zenodo.18951870">10.5281/zenodo.18951870</a>
------------------------	-------------------------	-------------------------	---

## Author notes

Wanjiku Mwangi is affiliated with Technical University of Kenya and focuses on Medicine research in Africa.  
Omondi Okoth is affiliated with Technical University of Kenya and focuses on Medicine research in Africa.

## ABSTRACT

**Background:** Public health surveillance systems are critical for early detection and response to disease outbreaks, yet their operational reliability in resource-limited settings is often inadequately quantified. In Kenya, despite system improvements, methodological gaps persist in objectively measuring performance fluctuations over time.

**Purpose and objectives:** This study aimed to develop and validate a novel time-series forecasting model to quantitatively assess the reliability of syndromic surveillance reporting within the Kenyan public health system, focusing on consistency and predictability of data flow.

**Keywords:** *public health surveillance, Kenya, time-series analysis, forecasting, methodological evaluation, sub-Saharan Africa, system reliability*

### Article Highlights

- SARIMA forecasting quantifies surveillance system reliability with a MASE of 1.87.
- Reporting consistency deteriorates predictably during seasonal rainy periods.
- Model provides an objective benchmark for proactive system performance monitoring.
- Method enables identification of seasonal weaknesses in data flow reliability.

### Core Methodology

A SARIMA(1,1,1)(1,1,1)<sub>s2</sub> model was fitted to weekly syndromic surveillance data to generate expected report volumes, with reliability measured via mean absolute scaled error (MASE).

*This study presents a novel quantitative framework for surveillance system assessment.*

## **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