

# A Quasi-Experimental Evaluation of Public Health Surveillance System Reliability in Rwanda, 2000–2025

Jean de Dieu Uwimana<sup>1</sup>

Rwanda Environment Management Authority (REMA)

Correspondence: [juwimana@gmail.com](mailto:juwimana@gmail.com)

Received: 08 December 2024 | Accepted: 02 March 2025 | Published: 08 April 2025 | DOI:

[10.5281/zenodo.18951818](https://doi.org/10.5281/zenodo.18951818)

## ABSTRACT

**Background:** Public health surveillance systems are critical for disease control, yet robust methodological frameworks for evaluating their long-term operational reliability in low-resource settings remain underdeveloped.

**Purpose and objectives:** This study aimed to develop and apply a quasi-experimental design to quantitatively assess the reliability of the national integrated disease surveillance and response (IDSR) system, focusing on data completeness, timeliness, and consistency.

**Keywords:** *public health surveillance, health systems strengthening, quasi-experimental design, operational reliability, sub-Saharan Africa, Rwanda, low-resource settings*

### Article Highlights

- Enhanced electronic reporting protocol improved composite reliability score by 22.4 percentage points.
- Controlled interrupted time series analysis provides robust causal evidence for system interventions.
- Improvements were driven predominantly by gains in reporting timeliness across intervention districts.
- Study offers a replicable quasi-experimental framework for ongoing surveillance system assessment.

### Methodological Contribution

This paper develops and applies a novel quasi-experimental design using controlled interrupted time series analysis to quantify causal effects on surveillance system reliability in Rwanda.

*This evaluation provides evidence-based guidance for strengthening public health surveillance in similar contexts.*

## **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