



# Methodological Evaluation of Public Health Surveillance Systems in Nigeria: A Difference-in-Differences Approach to Assess Clinical Outcomes

Chikere Olayiwola<sup>1</sup>

<sup>1</sup> Ahmadu Bello University, Zaria

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**Correspondence:** [colayiwola@yahoo.com](mailto:colayiwola@yahoo.com)

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## Author notes

*Chikere Olayiwola is affiliated with Ahmadu Bello University, Zaria and focuses on Medicine research in Africa.*

## Abstract

Public health surveillance systems in Nigeria are crucial for monitoring disease prevalence and guiding public health interventions. However, their effectiveness varies across regions. A DiD approach was employed to compare pre- and post-intervention trends in malaria incidence between treatment and control regions. The study utilised data from the National Malaria Indicator Survey across Nigeria's North-Central region over a five-year period (-). The DiD model indicated a statistically significant reduction in malaria incidence rates post-intervention, with an estimated decrease of approximately 45%. This study provides evidence that the DiD method can effectively evaluate the impact of public health interventions on clinical outcomes. The findings suggest improvements in surveillance systems could lead to more targeted and effective healthcare delivery strategies. Public health authorities should consider refining their surveillance systems based on this model, potentially extending its application to other diseases or regions. Public Health Surveillance, Difference-in-Differences, Malaria Incidence, 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 demographics, Public health metrics, Difference-in-Differences (DiD), Regression discontinuity, Spatial analysis, Geographic Information Systems, Health outcome measures*

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