African Medical Laboratory Haematology

Methodological Evaluation of Public Health Surveillance Systems in Nigeria: Multilevel Regression Analysis for Risk Reduction Studies

Chinedu Obinakwekwe[1,2], **Adeniran Ajayi**[2], **Olamilekan Ifolajulo**[3,4]

[1] Department of Pediatrics, University of Maiduguri

[2] Bayero University Kano

[3] Department of Clinical Research, Ladoke Akintola University of Technology (LAUTECH), Ogbomoso

[4] University of Maiduguri

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Correspondence: cobinakwekwe@aol.com

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Author notes

Chinedu Obinakwekwe is affiliated with Department of Pediatrics, University of Maiduguri and focuses on Medicine research in Africa.

Adeniran Ajayi is affiliated with Bayero University Kano and focuses on Medicine research in Africa.

Olamilekan Ifolajulo is affiliated with Department of Clinical Research, Ladoke Akintola University of Technology (LAUTECH), Ogbomoso and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in Nigeria are crucial for monitoring disease prevalence and implementing timely interventions. However, their effectiveness varies across different regions and levels of government. The study will employ a multilevel regression model with fixed effects for geographical regions and random effects for local government units. The primary outcome measure will be the incidence rate ratio (IRR) of healthcare utilization across different surveillance systems. In this initial phase, we observed an IRR of 1.23 (95% CI: 0.98-1.54) indicating a moderate effect size in favour of improved surveillance systems, suggesting potential areas for policy adjustments to enhance coverage and efficacy. This study aims to provide evidence-based recommendations for strengthening public health surveillance systems in Nigeria through methodological improvements and targeted interventions. Implementing the findings from this research can lead to more efficient allocation of resources and better coordination among stakeholders, ultimately improving health outcomes across the country. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Public health surveillance, Multilevel modelling, Regression analysis, Geographic variation, Epidemiologic methods, Health system evaluation*

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