African Clinical Nutrition

Methodological Evaluation of Public Health Surveillance Systems in Nigeria Using Multilevel Regression Analysis for Clinical Outcome Measurement

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Abstract

Public health surveillance systems in Nigeria are crucial for monitoring disease prevalence and guiding intervention strategies. However, their effectiveness is often under-researched, leading to potential inefficiencies or misalignment with clinical outcomes. The study will employ a mixed-method approach, integrating quantitative data from surveillance systems with qualitative insights through interviews and focus groups. Multilevel regression models will be used to analyse hierarchical data structures, accounting for variability at various levels (individuals, facilities, regions). A preliminary multilevel analysis revealed significant correlations between timely disease reporting in the surveillance system and improved patient outcomes in secondary healthcare facilities, suggesting a need for enhanced timeliness and accuracy. This study will provide insights into the efficacy of Nigeria's public health surveillance systems by integrating advanced statistical techniques to measure their impact on clinical outcomes at multiple levels. Future research should prioritise system improvements based on findings from this protocol, particularly focusing on enhancing timeliness and data accuracy in reporting mechanisms. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Multilevel, Regression, Epidemiology, PublicHealth, Surveillance, Evaluation*

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