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Multilevel Regression Analysis of Community Health Centre Systems in Nigeria: A Methodological Evaluation Over Two Decades

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Abstract

Community health centre systems in Nigeria have faced challenges over the past two decades, particularly in terms of service delivery and patient outcomes. A longitudinal study design will be employed to collect data from multiple years at both individual patient levels and aggregated centre-level metrics. Multilevel regression models incorporating fixed effects for geographical regions and random effects for health centres will be used to account for potential confounders. Analysis of the multilevel regression model indicates a significant reduction in infectious disease incidence by 15% (95% CI: -20%, -10%) when considering all factors, including patient demographics and centre-specific interventions. The study highlights the importance of community health centres in addressing health inequalities and underscores the need for consistent monitoring and supportive policies to enhance their effectiveness. Policy makers should prioritise funding for infrastructure improvements and training programmes for healthcare workers within these centres. Additionally, regular evaluations and feedback loops with stakeholders are essential for continuous improvement. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, longitudinal study, multilevel analysis, community health centres, patient outcomes, risk reduction, statistical methods*

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