



Methodological Evaluation of Community Health Centre Systems in Ghana Using Multilevel Regression Analysis

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Abstract

Community health centres in Ghana are crucial for providing accessible healthcare to rural populations. However, their operational efficiency varies significantly across different regions. A mixed-methods approach combining quantitative data from surveys and qualitative interviews with managers was used. Multilevel regression models were employed to analyse hierarchical data structure, including both individual-level (patients) and organisational-level (health centre). Multilevel regression analysis revealed that patient satisfaction had a significant positive impact on health centre efficiency, with an adjusted R^2 of 0.65. The findings suggest that improving patient care through targeted interventions can lead to substantial efficiency improvements in community health centres. Health authorities should prioritise initiatives aimed at enhancing patient satisfaction and training for healthcare staff. Treatment effect was estimated with $\text{text}\{ \logit \}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Multilevel Regression, Community Health Centres, African Geography, Public Health, Methodology, Evaluation*

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