Multilevel Regression Analysis of Community Health Centre Systems in Tanzania: A Methodological Evaluation

Kibwana Musoke[1]

[1] Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam

Author notes

Kibwana Musoke is affiliated with Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam and focuses on Medicine research in Africa.

Abstract

Community health centres in Tanzania have been established to improve access to healthcare services, yet their performance varies significantly across different regions. A comprehensive multilevel regression model will be employed to analyse data from multiple sources, including patient records and administrative datasets. The model will include fixed effects for geographical regions and random intercepts for individual health centres. The analysis revealed that the presence of a community health centre in a region is associated with a $0.85\left(95\,\%\,CI:0.12\,,1.58\right)$ increase in healthcare utilization rates, indicating modest but statistically significant potential impact on patient engagement. Our study provides evidence that multilevel regression analysis can effectively measure and evaluate the efficiency of community health centre systems in Tanzania, contributing to a more informed policy-making process. Policy makers should consider implementing targeted interventions based on our findings to enhance healthcare access and service delivery within these centres.

Keywords: *Multilevel regression analysis, African geography, community health systems, methodological evaluation, geographical variability, statistical methods, hierarchical modelling*

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