



Methodological Evaluation of Community Health Centres Systems in Ethiopia Using Multilevel Regression Analysis for Efficiency Gains

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Abstract

Community health centers (CHCs) in Ethiopia play a crucial role in providing essential healthcare services to underserved populations. However, their operational efficiency varies significantly across different regions and settings. A multilevel regression model was employed to analyse data from CHC performance evaluations. Data were collected at both the individual provider level and the facility-level, accounting for nested structures using hierarchical modelling techniques. The analysis revealed substantial variations in efficiency gains among different regions, with a significant proportion (45%) attributed to facility-level factors such as staffing levels and infrastructure quality. This study highlights the importance of addressing regional disparities in CHC systems for enhancing overall operational effectiveness. Policy makers should prioritise investments in facilities located in less efficient regions, particularly focusing on improving staff training and upgrading essential equipment. Community Health Centers, Ethiopia, Multilevel Regression Analysis, Efficiency Gains Treatment effect was estimated with $\text{text}\{ \text{logit} \}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, multilevel analysis, healthcare system, efficiency measurement, regression techniques, community health centers, resource allocation assessment*

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