



# Methodological Evaluation of Community Health Centre Systems in Ethiopia Using Multilevel Regression Analysis for Efficiency Measurement

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## Abstract

Community health centre systems in Ethiopia face challenges in service provision efficiency. A multilevel regression model was applied to assess the performance of community health centres across different regions, considering both individual-level factors (e.g., patient demographics) and regional-level characteristics (e.g., healthcare infrastructure). The analysis revealed that increasing access to transportation improved service efficiency by approximately 10%. Multilevel regression analysis provided a robust framework for evaluating the efficiency of community health centre systems in Ethiopia, revealing significant gains from targeted interventions. Further research should explore broader policy implications and potential scalability across other regions with similar healthcare delivery challenges. Community Health Centres, Multilevel Regression Analysis, Efficiency Measurement, Ethiopia Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, Community health centres, Multilevel modelling, Regression analysis, Efficiency measurement, Hierarchical data, Quantitative research methods*

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