



Methodological Assessment of Community Health Centre Systems in Ethiopia: A Panel Data Analysis on System Reliability

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Abstract

Community health centres (CHCs) play a crucial role in healthcare delivery in Ethiopia. Despite their importance, there is limited systematic assessment of their reliability and effectiveness. We employ a panel-data estimation approach to analyse existing studies. The study employs a linear mixed-effects model to estimate system reliability, accounting for time and spatial variations. Our analysis reveals that the variability in CHC performance is significantly influenced by both institutional factors (such as funding levels) and contextual variables (like community engagement). This review highlights the need for more robust methodological frameworks to accurately assess CHC systems, particularly in terms of reliability. Future research should focus on longitudinal studies with larger sample sizes to enhance the reliability and validity of system assessments. Community health centres, panel data analysis, reliability assessment, Ethiopia Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African healthcare, panel data analysis, system reliability, service delivery, community health centres, regression models, geographic information systems

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