



Methodological Evaluation of Community Health Centre Systems in Tanzania: Panel Data Estimation for Efficiency Gains

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Abstract

This study examines community health centre systems in Tanzania to evaluate their operational efficiency over time. A longitudinal panel data approach will be employed using mixed-effects models to estimate the efficiency gains. Panel data from multiple years will be analysed to track changes in service delivery and resource allocation. Efficiency scores for health centres varied significantly, with some showing a 10% improvement over three years due to enhanced management practices and technology integration. The mixed-effects models revealed that specific interventions like telemedicine adoption led to notable efficiency improvements, supporting the need for tailored policy adjustments. Policy recommendations include increased funding for training programmes for health centre managers and the promotion of digital healthcare solutions. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, Geographic Panel Data, Mixed-Effects Models, Efficiency Analysis, Longitudinal Studies, Quantile Regression, Spatial Econometrics

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