



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

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## Abstract

Community health centers (CHCs) in Uganda face challenges in service delivery efficiency. A random effects model was employed to estimate the technical efficiency of CHCs over time, accounting for unobserved heterogeneity. CHCs showed varying efficiencies with some achieving a mean efficiency score of 75% in managing health services. Efficiency gains can be achieved by optimising resource allocation and improving service delivery protocols. Implementing standardised training programmes for CHC staff and enhancing data collection methods are recommended. Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^* p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, community health centers, panel data, stochastic frontier analysis, technical efficiency, random effects model, econometrics*

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