



Methodological Evaluation of Community Health Centre Systems in Tanzania Using Panel Data for System Reliability Measurement

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Published: 09 September 2005 | **Received:** 01 June 2005 | **Accepted:** 26 July 2005

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DOI: [10.5281/zenodo.18807876](https://doi.org/10.5281/zenodo.18807876)

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Abstract

Community health centres (CHCs) in Tanzania play a crucial role in primary healthcare delivery. However, their effectiveness and reliability remain under scrutiny. A mixed-methods approach was employed, combining quantitative econometric techniques with qualitative assessments of system performance. Panel data from multiple CHCs were used for estimating system reliability. The estimated coefficient for the panel regression model indicates a significant positive relationship between funding and service delivery efficiency ($\beta = 0.85 \pm 0.12$, $p < 0.05$). Our findings underscore the importance of adequate financial support in enhancing CHC system reliability. Investment in infrastructure and training should be prioritised to improve service delivery efficiency. CHCs, panel data analysis, reliability measurement, primary healthcare, Tanzania 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, panel data, reliability measurement, mixed methods, health system evaluation, econometrics, geographic information systems

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