# Evaluating System Reliability in Tanzania's Community Health Centres Using Panel Data Analysis: An Assessment Framework

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## Abstract

Community health centers (CHCs) play a crucial role in delivering healthcare services to underserved populations in Tanzania. However, their operational effectiveness and reliability remain under scrutiny. A mixed-method approach combining quantitative and qualitative research was employed. Panel data from multiple CHCs were collected over two years to estimate system reliability through econometric modelling. The preliminary findings suggest a moderate level of system reliability, with some CHCs demonstrating higher efficiency in patient care processes compared to others. This study contributes valuable insights into the operational effectiveness of Tanzania's CHCs and identifies areas for improvement. Further research is recommended to validate these preliminary results. Policy recommendations include targeted training programmes for CHC staff, improved infrastructure investment, and enhanced data collection systems. Community Health Centers, System Reliability, Panel Data Analysis, One-Health Approach Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow} p\, X_i$, and uncertainty reported using confidence-interval based inference.

**Keywords:** *Tanzania, Community Health Centres, Panel Data, Reliability Analysis, Methodology, Healthcare Systems, Evaluation Framework*

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