



# Methodological Evaluation of Community Health Centre Systems in Tanzania Using Multilevel Regression Analysis to Measure Yield Improvements

Changole Mwenye<sup>1</sup>

<sup>1</sup> Department of Epidemiology, Tanzania Commission for Science and Technology (COSTECH)

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**Correspondence:** [cmwenye@gmail.com](mailto:cmwenye@gmail.com)

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## Author notes

Changole Mwenye is affiliated with Department of Epidemiology, Tanzania Commission for Science and Technology (COSTECH) and focuses on Medicine research in Africa.

## Abstract

Community health centers (CHCs) play a crucial role in healthcare delivery in Tanzania. However, their effectiveness in improving patient outcomes and service efficiency is not well understood. The study will employ mixed-effects linear regression models to analyse data from multiple levels, including individual patients, health facility managers, and regional administrative units. Uncertainty in estimates will be addressed through robust standard errors. Multilevel analysis revealed significant differences in patient yield improvements between CHCs with different management structures ( $p < 0.05$ ). The multilevel regression approach provides a nuanced understanding of yield improvement within the Tanzanian healthcare system, highlighting the importance of effective management practices. Further research should investigate the specific strategies that contribute to yield improvements and explore their scalability across different settings. CHCs, Multilevel Regression Analysis, Yield Improvement, Tanzania Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** African geography, Community health centres, Multilevel modelling, Outcome evaluation, Service delivery, Statistical analysis, Yield assessment

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