



# Methodological Assessment of Clinical Outcomes in Ethiopian Community Health Centres using Multilevel Regression Analysis

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## Abstract

This case study examines the clinical outcomes in Ethiopian community health centres (CHCs), focusing on methodological improvements to assess their performance. A multilevel regression model was employed to analyse data from multiple CHC sites across Ethiopia. The model accounts for both individual (patient-level) and contextual (site-level) effects. The analysis revealed significant site-specific variations in clinical outcomes, with one CHC achieving a 15% improvement in patient recovery rates compared to the national average. Multilevel regression analysis provided nuanced insights into CHC performance, highlighting the importance of considering both individual and contextual factors for comprehensive evaluation. Recommendations include targeted interventions at high-performing sites and standardised training programmes across all CHCs to enhance clinical outcomes. 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:** Ethiopia, Geographic Cluster Analysis, Multilevel Modelling, Outcome Assessment, Community Health Centres, Regression Analysis, Spatial Statistics

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