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Methodological Evaluation of Community Health Centre Systems in Uganda Using Multilevel Regression Analysis to Measure Cost-Effectiveness

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Abstract

Community health centers (CHCs) play a critical role in healthcare delivery across Uganda, especially in rural and underserved areas. However, their cost-effectiveness remains under-researched. The study will utilise multilevel regression models to analyse cost parameters at both individual patient and organisational levels. Uncertainty around model estimates will be addressed using robust standard errors. A preliminary analysis suggests that CHCs in rural settings have higher operational costs but achieve better health outcomes, indicating a need for targeted interventions to optimise resource allocation. The findings highlight the importance of stratified models in assessing cost-effectiveness and suggest areas where further research could enhance service delivery efficiency. Policy makers should prioritise investments in CHCs with evidence-based strategies tailored to specific community needs, considering both financial and health impact. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Multilevel, Regression, Cost-Effectiveness, Evaluation, Community, Healthcare, Infrastructure*

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