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Bayesian Hierarchical Model Assessment of Community Health Centre Systems in Uganda, 2012

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Abstract

This study examines the performance of community health centres in Uganda by applying a Bayesian hierarchical model to evaluate their cost-effectiveness. A Bayesian hierarchical model was employed to analyse data from community health centres across Uganda. The model accounts for variability at different levels (e.g., individual patient outcomes within a centre), providing insights into the cost-effectiveness of each facility relative to its size and location. The analysis revealed that smaller centres in rural areas had significantly higher costs per unit of service provided compared to larger urban facilities, which were more efficient. This study highlights the importance of considering both scale and geographical factors when assessing community health centre performance. Recommendations for policy makers include prioritising investments in infrastructure to improve efficiency in underserved regions. Policymakers should prioritise investment in rural healthcare facilities, aligning resources with areas where cost-effectiveness is most critical based on the findings of this study. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African health systems, Bayesian hierarchical models, cost-effectiveness analysis, geographic information systems, Monte Carlo simulations, predictive modelling, spatial statistics*

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