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Bayesian Hierarchical Model for Measuring Cost-Effectiveness in Community Health Centres Systems of Ethiopia: A Methodological Evaluation

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Abstract

Community health centres in Ethiopia face challenges related to cost-effectiveness, necessitating an evaluation of their systems. A Bayesian hierarchical model was employed to analyse data from Ethiopian community health centres, aiming to identify cost-effective interventions within the system. The analysis revealed that integrating telemedicine services into existing health centre operations had a significant positive impact on patient outcomes and reduced costs by 15% (95% credible interval: -20% to -10%). This study demonstrates the effectiveness of Bayesian hierarchical models in enhancing understanding of cost-effectiveness within community health systems. The findings suggest that policymakers should consider integrating telemedicine into community health centre operations as a viable strategy for improving efficiency and patient care. Treatment effect was estimated with $text\{logit\}(\pi)=beta 0+\vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, Hierarchical modelling, Cost-effectiveness analysis, Epidemiology, Public health, Regression analysis*

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