Bayesian Hierarchical Model for Evaluating Cost-Effectiveness Across Ethiopian Community Health Centers Systems

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Abstract

Community health centers (CHCs) play a critical role in healthcare delivery across Ethiopia's diverse geographical regions and socio-economic settings. A Bayesian hierarchical regression model was employed to analyse data from multiple Ethiopian CHCs, accounting for both fixed effects (e.g., administrative costs) and random effects (e.g., geographical variability). The analysis revealed significant variation in cost-effectiveness metrics across different regions of Ethiopia, with some areas showing up to a 15% improvement potential through targeted interventions. This study provides evidence for the need to tailor health centre management strategies based on local characteristics and performance data. Policy makers should prioritise resource reallocation towards CHCs in regions where cost-effectiveness is notably lower, leveraging regional-specific models for guidance. Bayesian Hierarchical Model, Community Health Centers, Cost-Effectiveness Analysis, Ethiopia Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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