African One Health (Human-Animal-Environment Interface - Medical/Vet focus)

Bayesian Hierarchical Model for Cost-Effectiveness Analysis of Community Health Centers in Rwanda

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Abstract

Bayesian hierarchical models have been increasingly used in cost-effectiveness analysis (CEA) to evaluate interventions across diverse settings. The study employed a comprehensive search strategy using electronic databases, including PubMed and Scopus, with inclusion criteria based on specific intervention types, geographic region, and data availability. A Bayesian hierarchical model was used to analyse the cost-effectiveness of community health centers in Rwanda over the period from to . The analysis revealed that incorporating uncertainty into cost-effectiveness estimates using Bayesian methods provided more robust insights compared to traditional approaches, with a significant reduction in variance across different healthcare settings. Bayesian hierarchical models offer a nuanced approach for evaluating the cost-effectiveness of community health centers in Rwanda, enhancing understanding of resource allocation and patient outcomes. Future research should consider expanding the model's applicability to include additional years or geographical areas to validate its reliability across broader contexts. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian hierarchical models, cost-effectiveness analysis, health economics, systematic review, randomized trials, decision analysis*

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