African Speech and Language Therapy (Research focus)

Bayesian Hierarchical Model for Measuring Cost-Effectiveness of Community Health Centres in South Africa: An Evaluation Study

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Abstract

Community health centres in South Africa face challenges in cost-effectiveness due to varying service delivery and funding allocation. A Bayesian hierarchical model was employed to analyse data from multiple community health centres across South Africa. The model accounts for both fixed and random effects to estimate cost-effectiveness ratios (CERs). The analysis revealed significant variability in CERs among regions, with some areas showing substantial underinvestment compared to others. The Bayesian hierarchical model effectively captured the heterogeneity of service delivery costs and outcomes across different health centres. This method provides a robust framework for future cost-effectiveness assessments. Future studies should consider extending the model to include additional variables such as patient demographics or disease prevalence, enhancing its utility in policy-making. Bayesian hierarchical model, community health centres, South Africa, cost-effectiveness, healthcare systems 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, Cost-Effectiveness Analysis, Hierarchical Models, Bayesian Statistics, Quantitative Methods, Community Health Systems, Econometric Modelling*

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