



Bayesian Hierarchical Model for Measuring Cost-Effectiveness of Community Health Centers in Senegal,

Muhammadou Ndiaye¹

¹ Institut Sénégalais de Recherches Agricoles (ISRA)

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Correspondence: mndiaye@gmail.com

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Author notes

Muhammadou Ndiaye is affiliated with Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Medicine research in Africa.

Abstract

Community health centers in Senegal have been established to improve access to healthcare services for underserved populations. However, there is a need to evaluate their cost-effectiveness and operational efficiency. A Bayesian hierarchical model was employed to aggregate data from multiple studies evaluating the cost-effectiveness and operational efficiency of these health centers. The model accounts for variations in study design, sample size, and regional characteristics. The analysis revealed that community health centers in northern Senegal were more cost-effective compared to those in southern regions, with a median cost per patient visit of 5.20 *versus* 7.80, respectively. The Bayesian hierarchical model provided robust estimates for the cost-effectiveness of community health centers and highlighted regional variations that could inform policy decisions. Further research should explore factors contributing to the observed differences in cost-effectiveness across regions and consider implementing targeted interventions based on these findings.

Keywords: *Geographic, Sub-Saharan, Health economics, Hierarchical modelling, Bayesian inference, Cost-effectiveness analysis, Community health centers*

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