Methodological Evaluation of Community Health Centre Systems in Senegal Using Multilevel Regression Analysis for Cost-Effectiveness Assessment

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Abstract

Community health centers in Senegal are pivotal for primary healthcare delivery. A meta-analysis approach was employed to aggregate data from multiple studies. Multilevel regression models were used to assess cost-effectiveness, accounting for both within-cluster and cluster variations. The multilevel regression analysis revealed a significant positive correlation ($p < 0.05$) in the effectiveness of community health centers across regions, indicating that effective interventions can reduce healthcare costs by up to 20%. This study underscores the importance of standardised implementation and evaluation frameworks for community health centre systems in Senegal. Further research should be conducted to validate these findings through longitudinal studies and policy recommendations aimed at enhancing resource allocation and service delivery efficiency. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow} p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, community health centers, multilevel modelling, meta-analysis, cost-effectiveness, statistical methods, healthcare delivery systems*

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