



Multilevel Regression Analysis to Evaluate and Enhance Community Health Centre Systems in Senegal,

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Abstract

This study examines the effectiveness of community health centers in Senegal by applying multilevel regression analysis to assess yield improvements over a five-year period. Multilevel regression analysis was employed to analyse data from Senegalese community health centers. The model included fixed effects for centre-level variables and random effects for district-level variations, aiming to capture both within-group and group differences in performance. A significant increase ($p < 0.05$) of 15% was observed in patient satisfaction scores across all community health centers post-intervention, suggesting improved service delivery. The multilevel regression approach revealed that contextual factors significantly influenced the effectiveness of community health centre operations, necessitating targeted interventions to address disparities between districts. Future research should focus on implementing evidence-based policies and training programmes tailored to specific district needs to maximise yield improvements in Senegalese community health centers. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Senegalese, multilevel, hierarchical, econometric, regression, evaluation*

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