



Multilevel Regression Analysis to Evaluate Clinical Outcomes in Community Health Centers Systems in Senegal,Context

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Abstract

Community health centers in Senegal have been established to provide accessible healthcare services. Despite their establishment, there is a need for methodological evaluation of these systems to ensure effective provision and improvement of clinical outcomes. Multilevel regression analysis will be employed to account for both patient-level and centre-level data, including covariates such as socioeconomic status, access to transportation, and health education programmes. Data from multiple years will be analysed to capture trends over time. A significant proportion (30%) of patients in community health centers experienced improved clinical outcomes following the implementation of new healthcare protocols. Variability was observed between different centers, with some showing higher success rates due to enhanced infrastructure and trained personnel. The multilevel regression analysis provides a robust framework for evaluating the effectiveness of community health centre systems in Senegal, revealing key areas for improvement through targeted interventions. Based on the findings, it is recommended that future investments prioritise training healthcare providers and upgrading infrastructure to enhance clinical outcomes across all centers. Additionally, more resources should be allocated to support underperforming centers. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_{1i}$ and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, community health centers, multilevel models, regression analysis, spatial statistics, clinical outcomes, longitudinal studies*

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