



Reliability Assessment in Senegalese Community Health Centre Systems Using Multilevel Regression Analysis: A Methodological Evaluation

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Abstract

Community health centres play a crucial role in healthcare delivery within Senegalese communities. However, there is limited systematic evaluation of their reliability and performance. Multilevel regression analysis was employed to evaluate system reliability. Data were collected from across 50 health centres representing various regions of Senegal. The multilevel model revealed significant variations in service delivery quality, with outpatient services showing higher reliability compared to other components. Our study underscores the importance of comprehensive evaluations for ensuring consistent and high-quality healthcare provision across Senegalese community health centres. Future research should consider longitudinal data collection to capture long-term system performance trends. Community Health Centres, Multilevel Regression Analysis, Reliability Assessment, Senegal Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, community health systems, multilevel analysis, reliability assessment, statistical methods, validity testing, measurement models*

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