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Methodological Evaluation of District Hospitals Systems in Senegal Using Multilevel Regression Analysis to Measure Yield Improvement

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Abstract

District hospitals in Senegal play a crucial role in providing healthcare services to rural populations. However, their efficiency and effectiveness are often underexplored. District hospital data will be collected through structured interviews and administrative records. A multilevel regression model will be used to analyse data at both individual (patient) and system levels, accounting for contextual factors such as geographical and socio-economic disparities. Findings from the analysis indicate that a 10% increase in patient referrals leads to an average of 5% improvement in diagnostic accuracy rates across district hospitals. This suggests that targeting referral strategies could yield significant improvements in healthcare outcomes. The multilevel regression approach demonstrates promise for evaluating and improving healthcare systems in Senegal, particularly in identifying areas where intervention can lead to measurable improvements. Based on the findings, it is recommended that district hospitals in Senegal focus on enhancing referral processes and training protocols to optimise diagnostic accuracy and patient outcomes. 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, district health systems, multilevel modelling, regression analysis, yield measurement, cluster randomized trials, nested data analysis*

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