Methodological Evaluation of District Hospitals Systems in Senegal Using Multilevel Regression Analysis for System Reliability Measurement

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Abstract

District hospitals in Senegal play a critical role in healthcare delivery but face challenges in maintaining system reliability. A systematic literature review will be conducted, focusing on studies published since . Studies will be selected based on predefined criteria including methodological rigor and relevance to Senegalese healthcare context. Data analysis will employ multilevel regression analysis, a statistical technique suitable for evaluating complex systems. The findings indicate that while multilevel regression analysis is effective in measuring system reliability, there is variability across studies in the application of control variables and data collection methods. Multilevel regression analysis can be used to assess system reliability within district hospitals in Senegal, but further research is needed to standardise methodologies and improve comparability between studies. Standardization of data collection protocols and inclusion of robust control variables are recommended for future research aiming at improving system reliability. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, district hospitals, multilevel models, healthcare delivery, reliability assessment, regression analysis, qualitative synthesis*

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