



Methodological Evaluation of District Hospitals Systems in Senegal Using Bayesian Hierarchical Models for Clinical Outcomes Measurement

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Abstract

District hospitals in Senegal play a crucial role in healthcare delivery but face challenges in providing consistent quality of care. This systematic literature review aims to evaluate their systems and identify best practices. A comprehensive search strategy was employed across multiple databases. Studies were critically appraised for relevance and quality. A Bayesian hierarchical model was used to analyse the data, accounting for variability at different levels (districts, hospitals). The analysis revealed a significant variation in clinical outcomes between districts, with an estimated mean difference of 15% in hospital readmission rates. This study highlights the importance of adopting Bayesian hierarchical models to accurately measure and compare clinical outcomes across different district hospitals in Senegal. District health authorities should consider implementing these models to improve monitoring and evaluation of healthcare systems, thereby enhancing patient care and reducing disparities. Bayesian Hierarchical Models, District Hospitals, Clinical Outcomes, Senegal Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African geography, hierarchical models, Bayesian statistics, clinical outcomes, district health systems, quality assurance, systematic review

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