African Food Systems Research (Interdisciplinary - incl Agri/Env)

Bayesian Hierarchical Model for Evaluating Yield Improvement in District Hospitals Systems of Senegal,

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Abstract

District hospitals in Senegal play a critical role in healthcare delivery, particularly for rural populations. However, their performance and efficiency need evaluation to optimise resource allocation and service provision. A Bayesian hierarchical model was employed to analyse data from district hospitals. The model accounts for spatial heterogeneity and temporal variation within districts, using a combination of patient satisfaction surveys and administrative records. The analysis revealed significant variations in hospital performance across different geographical regions, with urban areas showing higher yield improvement compared to rural settings ($p < 0.05$). This study provides empirical evidence on the effectiveness of district hospitals in Senegal and highlights the importance of considering regional differences when implementing healthcare interventions. Based on the findings, targeted training programmes and infrastructure development should be prioritised for rural districts to enhance service delivery and patient satisfaction. Bayesian hierarchical model, district hospitals, yield improvement, Senegal Treatment effect was estimated with $text{logit}(\pi) = beta 0 + \beta \vec{} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *District hospitals, Bayesian hierarchical models, Methodology, Public health, Resource allocation, Rural healthcare, Senegal*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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