African Family Medicine

Bayesian Hierarchical Model for Assessing Efficiency Gains in Senegalese District Hospitals Systems

Salif Sarr[1], **Mamadou Ndiaye**[2], **Cheikh Sylla**[2,3]

[1] Department of Surgery, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

[2] Université Alioune Diop de Bambey (UADB)

[3] Department of Surgery, African Institute for Mathematical Sciences (AIMS) Senegal

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Correspondence: ssarr@hotmail.com

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Author notes

Salif Sarr is affiliated with Department of Surgery, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Medicine research in Africa.

Mamadou Ndiaye is affiliated with Université Alioune Diop de Bambey (UADB) and focuses on Medicine research in Africa.

Cheikh Sylla is affiliated with Department of Surgery, African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.

Abstract

This study aims to evaluate the efficiency of district hospitals in Senegal by applying a Bayesian hierarchical model. A Bayesian hierarchical model was employed to analyse data from Senegalese district hospitals, providing insights into system performance through statistical inference. Bayesian estimates revealed significant variability in hospital efficiency across districts, with some showing substantial improvements over the study period. The findings suggest that targeted interventions could enhance overall healthcare delivery efficiency within Senegalese district hospitals. Based on these results, tailored support and resource allocation strategies should be implemented to improve efficiency in underserved areas. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Senegal, Bayesian Hierarchical Model, District Hospitals, Methodological Evaluation, Efficiency Gains, Quantitative Methods, Health Systems Reform*

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