



# Bayesian Hierarchical Model for Measuring Adoption Rates in Senegal's District Hospital Systems

Mamadou Diop<sup>1,2</sup>, Tayeb Ndiaye<sup>1,3</sup>

<sup>1</sup> Université Alioune Diop de Bambey (UADB)

<sup>2</sup> Institut Sénégalais de Recherches Agricoles (ISRA)

<sup>3</sup> Department of Clinical Research, Institut Sénégalais de Recherches Agricoles (ISRA)

**Published:** 08 March 2010 | **Received:** 12 November 2009 | **Accepted:** 17 January 2010

**Correspondence:** [mdiop@outlook.com](mailto:mdiop@outlook.com)

**DOI:** [10.5281/zenodo.18901603](https://doi.org/10.5281/zenodo.18901603)

## Author notes

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

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

## Abstract

The adoption rates of healthcare innovations in Senegal's district hospitals have been assessed through traditional methods with varying levels of success. A Bayesian hierarchical model was developed to analyse data from multiple districts, accounting for both local variations and overall trends. The model incorporates prior knowledge about healthcare practices to refine estimates of adoption rates across the system. The analysis revealed a significant variation in adoption rates among different hospital types ( $p < 0.05$ ), with primary health centers showing higher adoption compared to district hospitals, indicating the need for tailored interventions. This study validates the Bayesian hierarchical model as an effective tool for assessing and understanding adoption dynamics within Senegalese healthcare systems, thereby informing policy adjustments aimed at improving resource allocation and service delivery. Healthcare policymakers should prioritise the implementation of evidence-based strategies in primary health centers to promote broader system-wide adoption rates and improve overall patient outcomes. Adoption Rates, Bayesian Hierarchical Model, District Hospitals, Senegal Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, Bayesian inference, Hierarchical modelling, Methodology, Public health systems, Quantitative analysis, Spatial statistics*

## ABSTRACT-ONLY PUBLICATION

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

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge