



# Bayesian Hierarchical Model for Evaluating Risk Reduction in Public Health Surveillance Systems in Senegal

Mamadou Ndiaye<sup>1</sup>

<sup>1</sup> Department of Internal Medicine, Université Alioune Diop de Bambey (UADB)

**Published:** 09 March 2004 | **Received:** 07 November 2003 | **Accepted:** 12 February 2004

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

**DOI:** [10.5281/zenodo.18788507](https://doi.org/10.5281/zenodo.18788507)

## Author notes

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

## Abstract

Public health surveillance systems in Senegal are essential for monitoring infectious diseases. However, their effectiveness varies, necessitating a methodological evaluation. A Bayesian hierarchical model was developed to assess the impact of interventions on disease incidence. The model accounts for spatial and temporal variability, using data from multiple regions across Senegal. The model estimated a 20% reduction in reported infectious diseases compared to baseline levels, with significant heterogeneity observed between surveillance sites. This study provides evidence of risk reduction through the use of a Bayesian hierarchical model tailored for public health surveillance systems in heterogeneous settings. Policy-makers should consider implementing similar models and scaling up interventions based on the identified risk reduction patterns. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, Bayesian, Hierarchical, Markov, Chain, Model, Surveillance*

## 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