



Bayesian Hierarchical Model Assessment of Public Health Surveillance Systems in Senegal,

Mamadou Diop^{1,2}, Ibrahima Niang³, Séni Ndiaye⁴

¹ Université Gaston Berger (UGB), Saint-Louis

² African Institute for Mathematical Sciences (AIMS) Senegal

³ Department of Clinical Research, Cheikh Anta Diop University (UCAD), Dakar

⁴ Department of Surgery, Cheikh Anta Diop University (UCAD), Dakar

Published: 25 August 2005 | **Received:** 23 March 2005 | **Accepted:** 28 June 2005

Correspondence: mdiop@gmail.com

DOI: [10.5281/zenodo.18807799](https://doi.org/10.5281/zenodo.18807799)

Author notes

Mamadou Diop is affiliated with Université Gaston Berger (UGB), Saint-Louis and focuses on Medicine research in Africa.

Ibrahima Niang is affiliated with Department of Clinical Research, Cheikh Anta Diop University (UCAD), Dakar and focuses on Medicine research in Africa.

Séni Ndiaye is affiliated with Department of Surgery, Cheikh Anta Diop University (UCAD), Dakar and focuses on Medicine research in Africa.

Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of public health surveillance systems systems in Senegal: Bayesian hierarchical model for measuring risk reduction in Senegal. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of public health surveillance systems systems in Senegal: Bayesian hierarchical model for measuring risk reduction, Senegal, Africa, Medicine, intervention study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. 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, Model, Surveillance, Evaluation, Risk*

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

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



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge