



# Multilevel Regression Analysis for Evaluating Cost-Effectiveness of Public Health Surveillance Systems in Senegal,

Mamadou Diop<sup>1</sup>, Sabrina Ndiaye<sup>2,3</sup>, Aliou Coulibaly<sup>4</sup>, Mboup Diallo<sup>5,6</sup>

<sup>1</sup> Department of Public Health, African Institute for Mathematical Sciences (AIMS) Senegal

<sup>2</sup> Cheikh Anta Diop University (UCAD), Dakar

<sup>3</sup> Institut Sénégalais de Recherches Agricoles (ISRA)

<sup>4</sup> Department of Internal Medicine, African Institute for Mathematical Sciences (AIMS) Senegal

<sup>5</sup> Department of Pediatrics, African Institute for Mathematical Sciences (AIMS) Senegal

<sup>6</sup> Department of Internal Medicine, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

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

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## Author notes

*Mamadou Diop is affiliated with Department of Public Health, African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.*

*Sabrina Ndiaye is affiliated with Cheikh Anta Diop University (UCAD), Dakar and focuses on Medicine research in Africa.*

*Aliou Coulibaly is affiliated with Department of Internal Medicine, African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.*

*Mboup Diallo is affiliated with Department of Pediatrics, African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.*

## Abstract

Public health surveillance systems in Senegal have evolved over time, necessitating a methodological evaluation to assess their cost-effectiveness. Multilevel regression analysis will be employed to account for hierarchical data structures within the surveillance systems, including geographical and administrative levels. A significant proportion (35%) of the variance in surveillance system performance was attributed to differences between regions, with robust standard errors indicating high reliability. The multilevel regression analysis reveals that public health surveillance systems are more effective in certain regions than others, suggesting targeted interventions for improvement. Public health authorities should prioritise investments and resources in regions where the systems show lower performance to enhance overall effectiveness. multilevel regression, cost-effectiveness, public health surveillance, Senegal Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, Senegalese, multilevel, regression, cost-benefit, surveillance, evaluation

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