



Methodological Assessment of Public Health Surveillance Systems in Senegal Using Time-Series Forecasting Models: A Systematic Literature Review

Ibrahima Ngom¹, Amadou Diop¹, Mamoudou Sylla²

¹ African Institute for Mathematical Sciences (AIMS) Senegal

² Department of Internal Medicine, African Institute for Mathematical Sciences (AIMS) Senegal

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Correspondence: ingom@hotmail.com

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Author notes

Ibrahima Ngom is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.

Amadou Diop is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Medicine research in Africa.

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

Abstract

Public health surveillance systems in Senegal are crucial for monitoring diseases and public health events. However, their effectiveness can be enhanced through methodological improvements. A comprehensive search strategy was employed, including databases such as PubMed and Embase. Studies were selected based on predefined inclusion criteria, focusing on methodologies used in public health surveillance systems within Senegal. Analysis revealed that time-series forecasting models have been applied to predict disease outbreaks with moderate accuracy ($R^2 = 0.75 \pm 0.12$). The review identified several methodological gaps, particularly in data collection and model validation processes. Enhanced training for surveillance personnel and improved data infrastructure are recommended to improve the reliability of forecasting models. 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, Senegalese, surveillance, forecasting, methodology, epidemiology, public health

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