



Methodological Evaluation of Public Health Surveillance Systems in Senegal Using Time-Series Forecasting Models for Risk Reduction Measurement

Sene Gueye¹, Mamadou Sall^{1,2}, Toure Diallo^{3,4}, Diallo Ndiaye⁵

¹ Institut Pasteur de Dakar

² Institut Sénégalais de Recherches Agricoles (ISRA)

³ Department of Internal Medicine, Cheikh Anta Diop University (UCAD), Dakar

⁴ Department of Pediatrics, Université Gaston Berger (UGB), Saint-Louis

⁵ Université Gaston Berger (UGB), Saint-Louis

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Correspondence: sgueye@outlook.com

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Author notes

Sene Gueye is affiliated with Institut Pasteur de Dakar and focuses on Medicine research in Africa.

Mamadou Sall is affiliated with Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Medicine research in Africa.

Toure Diallo is affiliated with Department of Internal Medicine, Cheikh Anta Diop University (UCAD), Dakar and focuses on Medicine research in Africa.

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

Abstract

Public health surveillance systems in Senegal are crucial for monitoring disease trends and implementing timely interventions to reduce morbidity and mortality. The study will employ ARIMA (AutoRegressive Integrated Moving Average) model for forecasting disease incidence rates in Senegal. Uncertainty will be assessed through robust standard errors and confidence intervals. A preliminary analysis indicates a downward trend in the number of reported cases over the past five years, suggesting effective surveillance measures have reduced communicable diseases' impact. The ARIMA model demonstrates its utility for forecasting disease trends in Senegal's public health systems, providing insights into risk reduction strategies. Public health officials should continue and enhance existing surveillance efforts to sustain the observed downward trend in disease incidence. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Sub-Saharan, geographical, surveillance, forecasting, ARIMA, time-series, evaluation

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