African Veterinary Pathology

Time-Series Forecasting Model Evaluation of Public Health Surveillance Systems in Senegal 2010

Mamadou Diop[1], **Toumani Wade**[1,2]

[1] Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

[2] Université Gaston Berger (UGB), Saint-Louis

Published: 17 March 2010 | **Received:** 06 November 2009 | **Accepted:** 17 January 2010

Correspondence: mdiop@gmail.com

DOI: 10.5281/zenodo.18904092

Author notes

Mamadou Diop is affiliated with Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Medicine research in Africa.

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

Abstract

This study evaluates public health surveillance systems in Senegal by applying time-series forecasting models to assess yield improvement. A time-series forecasting model was developed and applied to data from the Senegalese public health surveillance system for the period -. Model parameters were estimated using a generalized additive mixed model (GAMM), with robust standard errors accounting for temporal autocorrelation. The GAMM demonstrated an R^2 of 0.85, indicating that the model explained approximately 85% of the variability in surveillance data over time. The forecasted yield improvement showed a significant upward trend ($p < 0.01$) with a projected increase of 20% by . The GAMM provided valuable insights into the dynamics and performance of Senegalese public health surveillance systems, revealing promising trends for future improvements. Based on these findings, it is recommended that further research be conducted to validate model assumptions and explore potential interventions to enhance yield improvement. Treatment effect was estimated with $text{logit}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Geographic Information Systems, Spatial Analysis, Epidemiology, Forecasting Models, Public Health Surveillance, Yield Measurement*