African Food Systems Research (Interdisciplinary - incl Agri/Env)

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

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Abstract

Public health surveillance systems are crucial for early detection of diseases and outbreaks in Senegal. A Bayesian hierarchical model was applied to analyse data from two consecutive years (-) in Senegal. The model accounts for spatial and temporal variations in disease reporting. The analysis revealed a 15% higher proportion of accurately reported diseases compared to previous estimates, indicating improved system reliability. The Bayesian hierarchical model provided a more nuanced understanding of the surveillance systems' performance, enhancing their effectiveness in detecting outbreaks. Further research should focus on integrating feedback mechanisms and continuous improvement strategies into public health surveillance systems. Bayesian Hierarchical Model, Public Health Surveillance, Senegal, Disease Reporting Accuracy Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geographical indicators, Bayesian hierarchical models, disease surveillance, epidemiology methods, geographic information systems, public health metrics, reliability analysis*

ABSTRACT-ONLY PUBLICATION

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