



Bayesian Hierarchical Model Evaluation of Public Health Surveillance Systems in Senegal: Methodological Insights and Yield Assessment

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Abstract

Public health surveillance systems in Senegal are crucial for monitoring diseases and guiding public health interventions. However, their effectiveness is often underpinned by methodological challenges. A Bayesian hierarchical model will be employed to analyse surveillance data from various regions. The model accounts for spatial and temporal variability, providing insights into system performance across different settings. The analysis revealed that the Bayesian approach significantly improved yield measurement accuracy compared to traditional methods. This study confirms the effectiveness of the Bayesian hierarchical model in enhancing public health surveillance systems' efficiency in Senegal. Policy makers should consider adopting this advanced modelling technique for future surveillance system evaluations. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Bayesian, Hierarchical, Methodology, Surveillance, Evaluation, Metrics

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