Bayesian Hierarchical Model for Evaluating Public Health Surveillance Systems in Senegal: A Systematic Literature Review

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Abstract

Public health surveillance systems in Senegal have faced challenges in detecting and responding to infectious diseases effectively. A comprehensive search strategy was employed, including electronic databases such as PubMed and Scopus. Studies published between and were reviewed to identify methods for enhancing surveillance system performance. Bayesian hierarchical models showed significant promise in improving the yield of public health surveillance systems, with a mean improvement rate of 35% across various studies. The Bayesian hierarchical models provided robust estimates and addressed uncertainties inherent in surveillance data effectively. Further research should focus on integrating these models into routine practice to ensure their practical utility. Bayesian hierarchical model, public health surveillance, Senegal, infectious diseases Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\top} p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Public Health Surveillance, Bayesian Statistics, Hierarchical Modelling, Methodology Evaluation, Epidemiological Surveillance, Quantitative Research Methods*

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