African Occupational Therapy Review (Research focus)

Bayesian Hierarchical Model for Assessing Risk Reduction in Public Health Surveillance Systems in Ethiopia: A Longitudinal Study

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Abstract

Public health surveillance systems in Ethiopia aim to monitor and respond to infectious diseases effectively. However, their reliability and efficiency vary over time. Bayesian Hierarchical Models were applied longitudinally across multiple surveillance sites in Ethiopia to assess variability and effectiveness of reporting metrics. The model revealed a significant decline ($p < 0.05$) in under-reporting rates from baseline to follow-up periods, indicating improved system performance over time. Bayesian hierarchical models provided robust insights into the dynamics of public health surveillance systems in Ethiopia, enhancing their reliability and responsiveness. Continued use of Bayesian methods for monitoring should be supported with further research on model validation and practical implementation. Bayesian Hierarchical Models, Public Health Surveillance, Risk Reduction, Ethopian Surveillance Systems Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\ p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Ethiopia, Geographic Variation, Bayesian Hierarchical Models, Methodological Evaluation, Public Health Surveillance Systems, Risk Reduction, Spatial Statistics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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