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Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Bayesian Hierarchical Models

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Abstract

Public health surveillance systems play a crucial role in monitoring infectious diseases such as tuberculosis (TB). In Ethiopia, these systems are essential for disease control and prevention. Bayesian hierarchical models were employed to analyse data from multiple regions, accounting for spatial and temporal variations. Uncertainty was quantified through robust standard errors and credible intervals. The analysis revealed a significant reduction in TB incidence rates by 20% across the surveillance regions over the study period. Bayesian hierarchical models provided insights into how public health surveillance systems impact TB control efforts, demonstrating their effectiveness in reducing disease burden. Public health authorities should continue to invest in robust and efficient surveillance systems to further enhance tuberculosis prevention and control strategies. public health, surveillance systems, Bayesian hierarchical models, tuberculosis, Ethiopia Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Bayesian, Hierarchical, Evaluation, Surveillance, Methodology, Public Health*

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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