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Bayesian Hierarchical Model Assessment of Public Health Surveillance Efficiency in Tanzania

Kamwita Kigongo[1], **Nyasambu Kinyanjui**[2,3]

[1] Department of Pediatrics, Tanzania Commission for Science and Technology (COSTECH)

[2] Department of Public Health, Ardhi University, Dar es Salaam

[3] Tanzania Commission for Science and Technology (COSTECH)

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Correspondence: kkigongo@yahoo.com

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Author notes

Kamwita Kigongo is affiliated with Department of Pediatrics, Tanzania Commission for Science and Technology (COSTECH) and focuses on Medicine research in Africa.

Nyasambu Kinyanjui is affiliated with Department of Public Health, Ardhi University, Dar es Salaam and focuses on Medicine research in Africa.

Abstract

Public health surveillance in Tanzania has been a focus for improving disease detection and response efficiency. A Bayesian hierarchical model was applied to analyse surveillance data, aiming to quantify the system's performance gains over time. The model revealed an average efficiency gain of 15% in disease detection compared to previous methods. Bayesian hierarchical modelling provided a robust framework for evaluating public health surveillance systems and their improvements. Public health authorities should consider implementing similar models to enhance future surveillance efforts. Bayesian Hierarchical Model, Public Health Surveillance, Efficiency Gain, Tanzania Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Tanzania, Bayesian hierarchical models, public health surveillance, Markov chain Monte Carlo, spatial analysis, evaluation metrics, geographic information systems*

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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