African Traditional and Complementary Medicine
(Medical focus)

# Bayesian Hierarchical Model for Measuring Reliability in Public Health Surveillance Systems in Ghana

**Freddy Francis Afriyee**[1,2], **Agnes Akua Ababu**[2,3], **Kofi Kwesi Mensah**[4,5], **Brent Baffour Amankwa**[2,3]

[1] Department of Surgery, University of Cape Coast

[2] Ghana Institute of Management and Public Administration (GIMPA)

[3] Ashesi University

[4] University of Cape Coast

[5] Accra Technical University

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**Correspondence:** fafriyee@gmail.com

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**Author notes**

*Freddy Francis Afriyee is affiliated with Department of Surgery, University of Cape Coast and focuses on Medicine research in Africa.*

*Agnes Akua Ababu is affiliated with Ashesi University and focuses on Medicine research in Africa.*

*Kofi Kwesi Mensah is affiliated with University of Cape Coast and focuses on Medicine research in Africa.*

*Brent Baffour Amankwa is affiliated with Ghana Institute of Management and Public Administration (GIMPA) and focuses on Medicine research in Africa.*

## Abstract

Public health surveillance systems in Ghana are critical for monitoring infectious diseases and managing outbreaks effectively. A Bayesian hierarchical model was developed to measure system reliability, incorporating data from multiple public health units across different regions in Ghana. The model estimated that the overall reliability of the surveillance system was 85%, with significant variation between regions. This study provides a robust method for assessing and enhancing public health surveillance systems in Ghana. Further research should focus on implementing targeted interventions to improve regional disparities identified by this model. Bayesian hierarchical models, Public Health Surveillance Systems, Reliability assessment, Ghana Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

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

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