



Bayesian Hierarchical Model for Measuring Cost-Effectiveness in Ghanaian Public Health Surveillance Systems: A Methodological Evaluation

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Abstract

Public health surveillance systems in Ghana are critical for monitoring infectious diseases and ensuring effective resource allocation. A Bayesian hierarchical model was employed to assess the cost-effectiveness of public health surveillance systems. The model accounts for variability across different regions and integrates both direct and indirect costs. The model revealed that the cost per case detected varied between $10^{\wedge} 25$, with a mean cost of \$18 per case. This study provides insights into the economic impact of public health surveillance systems in Ghana, offering a robust framework for future evaluations. The findings suggest that targeted investments should be made to improve surveillance infrastructure in regions where costs are higher.

Keywords: *Ghana, Hierarchical Modelling, Bayesian Statistics, Cost-Effectiveness Analysis, Public Health Surveillance, Epidemiology, Statistical Methods*

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