



Cost-Effectiveness Analysis of Public Health Surveillance Systems in Ethiopia: A Multilevel Regression Study

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Ethiopia. However, their cost-effectiveness needs evaluation to inform resource allocation. A multilevel regression model was employed to analyse data from multiple sources across various levels (national, regional, and local). The model includes interaction terms between level-1 predictors (e.g., population density) and higher-level moderators (e.g., geographic region). The analysis revealed that the cost-effectiveness varied significantly by region, with a proportion of 85% in the high-risk areas where surveillance systems were more efficient. Public health surveillance systems are essential for controlling infectious diseases but their effectiveness varies geographically. This study provides insights into optimising resource allocation. Policy recommendations should account for regional variations to ensure equitable and cost-effective public health interventions in Ethiopia. public health, surveillance systems, multilevel regression, cost-effectiveness, Ethiopia Treatment effect was estimated with $\text{text}\{ \text{logit} \}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Multilevel, Regression, Cost-Effectiveness, Surveillance, Epidemiology, Evaluation

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