African Media Theory and Research

Methodological Evaluation of Public Health Surveillance Systems in Ethiopia: Multilevel Regression Analysis for Risk Reduction Measurement

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Abstract

Public health surveillance systems in Ethiopia are critical for monitoring diseases and identifying outbreaks promptly. However, their effectiveness varies across different regions and levels of government intervention. This study employs a multilevel logistic regression model to analyse data from various regions, accounting for hierarchical structures within the system. Uncertainty is addressed through robust standard errors. Multilevel analysis revealed significant variation in surveillance effectiveness across regional levels (OR = 1.52, CI: 1.04-2.23). The multilevel regression model highlights the need for targeted interventions to enhance surveillance performance in high-risk regions. Policy recommendations include prioritising resource allocation towards underperforming regions and strengthening inter-regional collaboration.

Keywords: *Ethiopia, Geographic Information Systems, Spatial Analysis, Multilevel Modelling, Public Health Surveillance, Risk Assessment, Regression Analysis*

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