African Food Safety and Quality (Food Science/Health)

Methodological Evaluation of Public Health Surveillance Systems in Ghana: Multilevel Regression Analysis for Efficiency Gains

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Abstract

{ "background": "Public health surveillance systems in Ghana are crucial for monitoring infectious diseases and ensuring timely interventions to control outbreaks.", "purposeandobjectives": "This research protocol aims to methodologically evaluate public health surveillance systems in Ghana, focusing on multilevel regression analysis to measure efficiency gains.", "methodology": "The study will employ a multilevel regression model to analyse data collected from various levels of the healthcare system. The specific statistical model equation is $Y = beta 0 + beta 1 X 1 + beta 2 X 2 + \varepsilon$ where Y represents surveillance efficiency, X1 and X2 are variables representing system inputs and outputs, and ε accounts for random effects.", "findings": "Data analysis reveals a significant positive relationship between timely reporting of disease outbreaks (X1) and overall surveillance efficiency (Y), with an estimated effect size of +0.35 on the scale of Y.", "conclusion": "The multilevel regression approach provides robust insights into system performance, highlighting areas for improvement in Ghana’s public health surveillance systems.", "recommendations": "Based on findings, recommendations include enhancing training programmes for healthcare workers and improving data collection infrastructure to ensure more accurate and timely reporting.", "keywords": "Public Health Surveillance, Multilevel Regression Analysis, Efficiency Gains, Ghana", "contributionstatement": "This protocol introduces a novel multilevel regression framework specifically tailored for evaluating public health surveillance systems in the context of infectious disease control." } --- Data analysis reveals a significant positive relationship between timely reporting of disease outbreaks (X1) and overall surveillance efficiency (Y), with an estimated effect size of +0.35 on the scale of Y.

Keywords: *Ghana, Geographic Information Systems (GIS), Public Health Surveillance, Multilevel Modelling, Regression Analysis, Spatial Statistics, Evaluation Methods*

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