African Pharmaceutical Economics (Health Systems focus)

Methodological Evaluation of Public Health Surveillance Systems in Ghana: A Multilevel Regression Analysis for Clinical Outcomes Observation

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Abstract

Public health surveillance systems in Ghana are essential for monitoring disease prevalence and guiding public health interventions. However, their effectiveness can vary across different levels of healthcare delivery. A multilevel regression analysis was employed to assess the impact of surveillance system design, staff training, and data accessibility on clinical outcomes. Data from multiple sources were combined and analysed using a generalized linear mixed model (GLMM) with robust standard errors. The GLMM revealed that improved data accessibility at the primary healthcare level significantly reduced diagnostic errors by approximately 20% compared to facilities without adequate resources, indicating effective surveillance system performance in enhancing clinical accuracy. This study provides evidence on how public health surveillance systems can be optimised for better clinical outcomes. The findings suggest a need for consistent data flow and enhanced training programmes to ensure reliable surveillance across the healthcare spectrum. Health policymakers should prioritise investments in infrastructure and human resources to support robust public health surveillance networks, particularly at the grassroots level where diagnostic accuracy is paramount. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Africa, Quantitative, Epidemiology, Multilevel, Regression, Outcome*

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