African Trauma and Mental Health (Psychology)

Methodological Evaluation of Public Health Surveillance Systems in Kenya Using Multilevel Regression Analysis to Assess System Reliability

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Abstract

Public health surveillance systems in Kenya are essential for monitoring disease prevalence and guiding intervention strategies. However, their effectiveness can vary significantly across different regions and levels of government. A comprehensive search strategy was employed to identify relevant studies published between and . Multilevel regression models were applied to analyse data from these studies, accounting for both regional and hierarchical effects. Multilevel regression analysis revealed a significant proportion ($p < 0.05$) of systematic variation in surveillance system reliability across different regions, suggesting the need for tailored interventions. The multilevel regression models provide robust evidence to support the development of targeted improvement strategies for public health surveillance systems in Kenya. Public health authorities should prioritise data collection and analysis at both regional and national levels to enhance system reliability and effectiveness. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, multilevel modelling, systematic review, data reliability, intervention effectiveness, spatial analysis*

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