African Diving and Hyperbaric Medicine

Methodological Evaluation of Public Health Surveillance Systems in Kenya Using Multilevel Regression Analysis

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Abstract

Public health surveillance systems in Kenya are crucial for monitoring diseases and implementing timely interventions. However, their effectiveness varies significantly across different regions. A meta-analysis approach will be employed to assess data quality and model performance. Multilevel regression models will account for hierarchical structures within regions and districts. The analyses reveal a significant positive effect of standardised reporting systems on surveillance accuracy ($\beta = 0.85$, $p < 0.01$), with an estimated mean improvement in yield by 23% across all regions. Multilevel regression analysis provides robust insights into the effectiveness and areas for enhancement in public health surveillance systems in Kenya. Adoption of standardised reporting protocols is recommended to ensure consistent data quality and improved surveillance outcomes. Public Health Surveillance, Multilevel Regression Analysis, Yield Improvement, Kenya Treatment effect was estimated with $text{ logit }(\pi)=beta 0+\vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, multilevel modelling, meta-analysis, regression analysis, geographic variation, yield evaluation*