African Critical Care Nursing

Methodological Evaluation of Public Health Surveillance Systems in Uganda Using Difference-in-Differences Approach to Assess Risk Reduction Efforts

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Abstract

Public health surveillance systems in Uganda are essential for monitoring infectious diseases such as malaria and tuberculosis (TB). However, the effectiveness of these systems can vary over time due to changes in disease prevalence or intervention strategies. The study employed a difference-in-differences (DiD) model, which compares changes over time between an intervention group and a comparison group. Data from surveillance records were analysed using statistical software to evaluate the effectiveness of public health interventions. A significant reduction in TB case notifications was observed during the period when preventive measures were introduced, suggesting that DiD method can effectively highlight the impact of such efforts on disease reporting. The difference-in-differences approach demonstrated its utility for evaluating the effectiveness of public health interventions in Uganda. The findings support the implementation of targeted strategies to improve surveillance systems and enhance disease control outcomes. Public health officials should consider implementing DiD models as a standard methodological tool for assessing the impact of interventions on surveillance system performance. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Geographic Information Systems, Public Health Surveillance, Difference-in-Differences, Randomized Controlled Trials, Spatial Analysis, Epidemiology*

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