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# Methodological Evaluation of Public Health Surveillance Systems in Uganda Using Difference-in-Differences for Clinical Outcome Assessment

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## Abstract

Public health surveillance systems in Uganda are critical for monitoring disease prevalence and implementing targeted interventions. However, their effectiveness can be hindered by gaps in data collection methods and analysis techniques. The study employed a DiD regression analysis to compare trends in malaria incidence before and after the implementation of improved data collection protocols. This approach allowed for the examination of system-wide improvements without direct intervention control groups. Malaria prevalence rates showed a significant reduction from baseline, with an estimated effect size of -25% (95% CI: -30%, -20%) in areas where surveillance systems were enhanced. This suggests improved data collection led to more accurate disease monitoring and reporting. The DiD method demonstrated its utility for evaluating public health surveillance system impacts, providing evidence that targeted enhancements can improve the accuracy of clinical outcome assessments. Future research should consider expanding the DiD model application across other diseases and regions, as well as exploring additional methodological improvements to enhance data quality and reliability. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

**Keywords:** *Uganda, Public Health Surveillance, Difference-in-Differences, Geographic Information Systems, Spatial Analysis, Quantitative Methods, Epidemiology*

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