African Health Communication (Media/Health/Social)

# Methodological Evaluation of Public Health Surveillance Systems in Ghana Using Difference-in-Differences Models to Assess System Reliability

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## Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and other public health events in developing countries like Ghana. The study will use difference-in-differences (DiD) regression analysis, a statistical method designed to isolate the effect of an intervention or treatment from other factors affecting system performance. The DiD model will compare changes in surveillance data before and after a hypothetical policy change with no actual change implemented, allowing for robust assessment of system reliability. The application of the DiD model revealed that the public health surveillance systems in Ghana showed significant improvement ($p < .05$) in reporting accuracy following a simulated intervention scenario, indicating enhanced system reliability. This study provides evidence supporting the efficacy of using DiD models to assess the performance and reliability of public health surveillance systems in Ghana. The findings contribute to better understanding the impact of policy changes on these critical systems. The results suggest that regular audits and training programmes should be implemented to further enhance system performance, thereby improving overall public health outcomes in Ghana. public health surveillance, difference-in-differences models, system reliability, healthcare monitoring, Ghana Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, Public health surveillance, Difference-in-differences, Comparative effectiveness research, System reliability, Data quality assessment, Randomized controlled trials*

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