



# Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Difference-in-Differences Models

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## Abstract

Public health surveillance systems are critical for monitoring infectious diseases in Ethiopia, where they play a vital role in disease prevention and control. The review will employ systematic methods to identify relevant studies, assess their methodologies, and analyse the application of difference-in-differences (DID) models. DID models will be used to estimate changes in surveillance system performance over time, accounting for potential confounders. A key finding is that the use of DID models has shown varying degrees of success in detecting efficiency gains, with some systems demonstrating substantial improvements while others show no significant change or even decline. DID models appear to be effective tools for evaluating public health surveillance system performance but require careful consideration of model assumptions and potential biases. Future studies should consider using DID models in conjunction with other evaluation methods, such as cost-effectiveness analyses, to provide a more comprehensive understanding of surveillance system efficacy. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Public Health Surveillance, Difference-in-Differences, Evaluation Methods, Spatial Analysis, Epidemiology, Quantitative Research

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