



# Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Difference-in-Differences for Efficiency Analysis

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## Abstract

Public health surveillance systems play a crucial role in monitoring infectious diseases such as malaria, tuberculosis (TB), and HIV/AIDS. The study employed a difference-in-differences model to analyse pre- and post-intervention data from selected regions. Data on reported cases before and after implementing new surveillance protocols were collected and analysed. A significant increase of 20% in the detection rate of malaria was observed, suggesting improved efficiency in surveillance systems. The difference-in-differences model effectively highlighted improvements in public health surveillance systems in Ethiopia. Further studies should consider expanding coverage to include more regions and diseases for a comprehensive evaluation. Public Health Surveillance, Difference-in-Differences, Efficiency Analysis, Public Health Systems, Ethiopia Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Geographic Information Systems (GIS), Public Health Surveillance, Difference-in-Differences, Efficiency Analysis, Spatial Statistics, Data Quality Assessment

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