



Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Difference-in-Differences for Clinical Outcome Measurement

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Abstract

Public health surveillance systems are crucial for monitoring disease prevalence and implementing effective prevention strategies in Ethiopia. The study employed a difference-in-differences (DiD) model to assess changes in dental caries prevalence before and after implementing new surveillance protocols. The DiD approach compares pre- and post-intervention trends across intervention and control groups. A statistically significant decrease of 15% in dental caries incidence was observed in the intervention group compared to a 7% increase in the control group, with a confidence interval around the estimated effect size of ± 2 percentage points. The DiD model effectively captured changes in clinical outcomes due to surveillance system interventions, providing robust evidence for policy recommendations. Public health authorities should prioritise continuous monitoring and periodic updates to public health surveillance systems to maintain effective disease prevention strategies. public health surveillance, difference-in-differences, dental caries incidence, Ethiopia Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Ethiopia, Public Health Surveillance, Difference-in-Differences, Clinical Outcomes, Geographic Epidemiology, Methodological Evaluation, Quantitative Methods

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