



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

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Abstract

Public health surveillance systems play a crucial role in monitoring infectious diseases and other public health threats. Ethiopia has established such systems but faces challenges in their effectiveness. A DiD approach was employed to assess changes in measles incidence before and after system implementation. Time-series data from two regions: Addis Ababa (with the surveillance system) and Dire Dawa (without it). The analysis revealed a significant decrease in measles cases in Addis Ababa compared to Dire Dawa, suggesting that the surveillance system has improved public health outcomes. The DiD model demonstrated the effectiveness of the public health surveillance system in Ethiopia by comparing pre- and post-intervention changes in measles incidence. Further implementation and continuous monitoring are recommended to maintain the surveillance system's efficacy. Public Health Surveillance, Difference-in-Differences, Measles Incidence, Ethiopian Public Health System Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^* p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Ethiopia, Geographic Information Systems (GIS), Public Health, Surveillance, Data Analysis, Randomized Controlled Trials, Difference-in-Differences

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