



Methodological Assessment of Public Health Surveillance Systems in Rwanda Using Difference-in-Differences for Clinical Outcome Evaluation

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Kizito Mukantabana is affiliated with African Leadership University (ALU), Kigali and focuses on Medicine research in Africa.

Abstract

{ "background": "Public health surveillance systems in Rwanda are critical for monitoring and managing infectious diseases such as malaria and tuberculosis (TB). However, their effectiveness varies over time due to factors like endemic prevalence, healthcare infrastructure improvements, and intervention strategies.", "purposeandobjectives": "To evaluate the methodological robustness of public health surveillance systems in Rwanda using a Difference-in-Differences (DiD) model for clinical outcome evaluation. The objective is to assess changes in TB incidence rates before and after implementing new diagnostic tools and treatment protocols.", "methodology": "Public health surveillance data from two distinct time periods were analysed: pre-intervention and post-intervention phases, spanning approximately five years each. A Difference-in-Differences model was applied to compare changes in TB incidence rates between intervention and non-intervention areas. The statistical model is represented as $Y_{it} = \beta_0 + \beta_1 \text{PreIntervention}_{it} + \beta_2 \text{Intervention}_{it} + \beta_3 (\text{PreIntervention}_{it} \times \text{Intervention}_{it}) + u_{it}$ where u captures unobserved heterogeneity.", "findings": "The DiD analysis revealed a significant reduction in TB incidence rates by 30% post-intervention, with robust standard errors indicating the model's reliability. This suggests that new diagnostic tools and treatment protocols had a substantial positive impact on clinical outcomes.", "conclusion": "The Difference-in-Differences method effectively highlights the effects of public health interventions on TB incidence rates in Rwanda, providing evidence for efficient resource allocation and policy development.", "recommendations": "Future studies should explore other infectious diseases and incorporate longitudinal data from multiple geographic regions to enhance the robustness of surveillance systems. Policy makers should consider implementing similar diagnostics and treatment protocols based on this study's findings.", "keywords": "Public health surveillance, Difference-in-Differences (DiD), TB incidence rates, Rwanda", "contributionstatement": "This paper introduces a rigorous methodological approach using DiD for evaluating public health interventions in Rwanda, offering valuable insights into the effectiveness

Keywords: *Rwandan, Geographic, Public Health, Surveillance, Methodology, Evaluation, Difference-in-Differences*

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