



Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Difference-in-Differences Models for Clinical Outcome Assessment,

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Abstract

Public health surveillance systems are crucial for monitoring and managing disease outbreaks in South Africa. These systems often utilise difference-in-differences (DID) models to assess clinical outcomes, but methodological rigor varies. A systematic literature search was conducted to identify studies that employed DID models for assessing clinical outcomes related to public health surveillance. Studies were selected based on their methodological quality and relevance to the field of medicine in South Africa. Of the included studies, only two used robust DID methods with appropriately defined control groups, demonstrating significant improvement in influenza-related hospitalizations over time ($p < 0.05$). Despite the use of DID models, methodological inconsistencies and variability exist among public health surveillance systems in South Africa. Future research should prioritise enhancing methodological rigor to ensure accurate clinical outcome assessments using DID models. 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: *African geography, public health surveillance, difference-in-differences, clinical outcome assessment, epidemiology, statistical methods, longitudinal studies*

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