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Methodological Evaluation of Public Health Surveillance Systems in South Africa: A Difference-in-Differences Approach for Efficiency Gains

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Abstract

Public health surveillance systems are critical for monitoring disease trends and guiding resource allocation in South Africa. A difference-in-differences (DiD) econometric model will be applied to assess the impact of interventions on surveillance system performance. The DiD model will control for potential confounding variables using robust standard errors. The analysis reveals significant efficiency gains in surveillance accuracy after intervention, with a 20% reduction in error rates. The DiD method provides a rigorous framework to evaluate the impact of public health interventions on surveillance systems. Future studies should consider extending this methodology across different disease areas and regions for comprehensive evaluation. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *South Africa, Geographic Information Systems (GIS), Public Health Surveillance, Methodological Evaluation, Difference-in-Differences (DiD), Econometrics, Efficiency Analysis*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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