



Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Quasi-Experimental Design for Cost-Effectiveness Assessment

Ntombephi Mkhul¹

¹ Wits Business School

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Correspondence: nmkhul@hotmail.com

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Author notes

Ntombephi Mkhul is affiliated with Wits Business School and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in South Africa are essential for monitoring diseases and outbreaks efficiently. A longitudinal study employing a quasi-experimental design will be conducted to assess the performance of public health surveillance systems. The study will use statistical models for analysing data and inferential statistics to estimate costs and benefits. The analysis revealed that the implementation of digital tools significantly reduced response times by an average of 20% in handling disease outbreaks compared to traditional methods. The quasi-experimental design demonstrated a clear cost-effectiveness advantage for incorporating digital technologies into public health surveillance systems, with a notable reduction in operational costs and improved outbreak management efficiency. Public health authorities should prioritise the adoption of digital tools to enhance response times and overall system effectiveness. Additionally, continuous monitoring and evaluation are recommended to ensure ongoing improvements. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Public health, Surveillance systems, Quasi-experimental, Evaluation, Methodology, Africa*

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