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Methodological Evaluation of Public Health Surveillance Systems in South Africa Using Panel Data for Risk Reduction Assessment

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Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of public health surveillance systems systems in South Africa: panel-data estimation for measuring risk reduction in South Africa. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of public health surveillance systems systems in South Africa: panel-data estimation for measuring risk reduction, South Africa, Africa, Medicine, protocol This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, public health, surveillance, panel data, econometrics, intervention strategies, risk assessment*

ABSTRACT-ONLY PUBLICATION

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