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Multilevel Regression Analysis to Evaluate Adoption Rates in Public Health Surveillance Systems in South Africa: A Methodological Protocol

Themba Dlamini[1,2], **Sibusiso Mncube**[3], **Tshepo Hlalela**[2]

[1] Department of Public Health, Wits Business School

[2] Stellenbosch University

[3] Department of Pediatrics, University of Johannesburg

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Correspondence: tdlamini@gmail.com

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Author notes

Themba Dlamini is affiliated with Department of Public Health, Wits Business School and focuses on Medicine research in Africa.

Sibusiso Mncube is affiliated with Department of Pediatrics, University of Johannesburg and focuses on Medicine research in Africa.

Tshepo Hlalela is affiliated with Stellenbosch University and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in South Africa aim to monitor disease incidence and implement targeted interventions. However, their adoption rates vary significantly across regions and healthcare facilities. The research will employ multilevel logistic regression models to analyse data from South African healthcare facilities. Hierarchical structures at both the regional (level 1) and national (level 2) levels will be incorporated, ensuring comprehensive coverage of adoption rates across different settings. We expect to find a significant proportion (e.g., 30%) variation in adoption rates attributed to factors such as funding availability and local healthcare facility capacity. Regional disparities will also be evident with some regions showing higher adoption rates than others. The findings from this study will contribute valuable insights into the effectiveness of public health surveillance systems in South Africa, particularly regarding regional differences and underlying determinants of system uptake. Based on our analysis, we recommend targeted interventions to enhance system adoption in regions with lower rates. Additionally, ongoing monitoring is essential to ensure sustained system functionality across all healthcare facilities. Public health surveillance systems, multilevel regression, adoption rates, South Africa Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Africa, Multilevel, Analysis, Spatial, Dynamics, Healthcare*

ABSTRACT-ONLY PUBLICATION

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