



Methodological Evaluation of Public Health Surveillance Systems in Uganda Using Difference-in-Differences Model to Assess System Reliability

Kabirikwa Nakitagi^{1,2}, Wanyonyi Onyango^{3,4}

¹ Department of Pediatrics, Uganda Christian University, Mukono

² Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

³ Department of Epidemiology, Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

⁴ Uganda Christian University, Mukono

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Correspondence: knakitagi@aol.com

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Author notes

Kabirikwa Nakitagi is affiliated with Department of Pediatrics, Uganda Christian University, Mukono and focuses on Medicine research in Africa.

Wanyonyi Onyango is affiliated with Department of Epidemiology, Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit and focuses on Medicine research in Africa.

Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of public health surveillance systems systems in Uganda: difference-in-differences model for measuring system reliability in Uganda. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. 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 Uganda: difference-in-differences model for measuring system reliability, Uganda, Africa, Medicine, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Public Health Surveillance, Methodology, Difference-in-Differences, System Reliability, Epidemiology, Geographic Medicine*

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