African Sports Medicine Journal

Methodological Evaluation of Public Health Surveillance Systems in Ethiopia Using Multilevel Regression Analysis to Measure System Reliability

Mulu Alemayehu[1,2], **Fasil Assefa**[3,4]

[1] Department of Clinical Research, Haramaya University

[2] Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

[3] Department of Internal Medicine, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

[4] Haramaya University

Published: 11 May 2005 | **Received:** 24 December 2004 | **Accepted:** 10 April 2005

Correspondence: malemayehu@aol.com

DOI: 10.5281/zenodo.18807517

Author notes

Mulu Alemayehu is affiliated with Department of Clinical Research, Haramaya University and focuses on Medicine research in Africa.

Fasil Assefa is affiliated with Department of Internal Medicine, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa 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 Ethiopia: multilevel regression analysis for measuring system reliability in Ethiopia. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured review of relevant literature was conducted, with thematic synthesis of key findings. 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 Ethiopia: multilevel regression analysis for measuring system reliability, Ethiopia, Africa, Medicine, meta analysis 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: *Ethiopia, Public Health Surveillance, Multilevel Analysis, Reliability Assessment, System Evaluation, Regression Models, Geographic Epidemiology*

ABSTRACT-ONLY PUBLICATION

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

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge