Methodological Assessment of Public Health Surveillance Systems in Ethiopia Using Panel Data Analysis to Evaluate Adoption Rates

Meskerem Debretsionayi[1,2]**, Seyoum Asrat Abebe**[3]

[1] Department of Pediatrics, Adama Science and Technology University (ASTU)

[2] Department of Clinical Research, Hawassa University

[3] Adama Science and Technology University (ASTU)

Author notes

Meskerem Debretsionayi is affiliated with Department of Pediatrics, Adama Science and Technology University (ASTU) and focuses on Medicine research in Africa.

Seyoum Asrat Abebe is affiliated with Adama Science and Technology University (ASTU) 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: panel-data estimation for measuring adoption rates in Ethiopia. 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 Ethiopia: panel-data estimation for measuring adoption rates, Ethiopia, Africa, Medicine, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\neg} p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Ethiopia, Geographic Information Systems (GIS), panel data, health systems strengthening, surveillance effectiveness, evaluation metrics, spatial analysis*

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