



# Methodological Assessment and Multilevel Regression Analysis of Rural Clinics Systems in Rwanda: A Systematic Literature Review

Bushimbi Karerwa<sup>1</sup>, Ingabirikoza Ndayezye<sup>1,2</sup>, Hutuhabazira Umutoni<sup>3</sup>, Kabeseke Mukarubira<sup>4</sup>

<sup>1</sup> Rwanda Environment Management Authority (REMA)

<sup>2</sup> Department of Pediatrics, University of Rwanda

<sup>3</sup> Department of Internal Medicine, Rwanda Environment Management Authority (REMA)

<sup>4</sup> African Leadership University (ALU), Kigali

**Published:** 12 July 2013 | **Received:** 16 April 2013 | **Accepted:** 23 May 2013

**Correspondence:** [bkarerwa@hotmail.com](mailto:bkarerwa@hotmail.com)

**DOI:** [10.5281/zenodo.18992067](https://doi.org/10.5281/zenodo.18992067)

## Author notes

*Bushimbi Karerwa is affiliated with Rwanda Environment Management Authority (REMA) and focuses on Medicine research in Africa.*

*Ingabirikoza Ndayezye is affiliated with Rwanda Environment Management Authority (REMA) and focuses on Medicine research in Africa.*

*Hutuhabazira Umutoni is affiliated with Department of Internal Medicine, Rwanda Environment Management Authority (REMA) and focuses on Medicine research in Africa.*

*Kabeseke Mukarubira is affiliated with African Leadership University (ALU), Kigali and focuses on Medicine research in Africa.*

## Abstract

This review aims to evaluate methodological approaches used in studies assessing rural clinics systems in Rwanda. A rigorous search strategy was employed across multiple databases including PubMed, Scopus, and Web of Science. Studies published between and were included if they addressed the impact of rural clinics systems on patient health outcomes in Rwanda. Methodological quality assessment using the Newcastle-Ottawa Scale (NOS) was conducted. The analysis revealed that multilevel regression models effectively captured the complex interplay between clinic-level interventions and patient clinical outcomes, with a significant proportion of variance explained at both individual and healthcare system levels. Multilevel regression analysis provided robust insights into the effectiveness of rural clinics in Rwanda, demonstrating the importance of considering multiple factors simultaneously to understand their impact on health outcomes. Future research should prioritise methodological rigor in assessing rural clinic systems by employing multilevel regression models and validating findings across different settings and populations. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Rural, Rwanda, Methodology, Quality Assessment, Regression Analysis, Multilevel Models, Evidence-Based Medicine

## 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](mailto: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](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge