



Methodological Evaluation of Community Health Centre Systems in Rwanda Using Panel Data for System Reliability Assessment

Ingirih Nyiramwami¹, Kabuye Nshuti^{2,3}

¹ Department of Pediatrics, University of Rwanda

² University of Rwanda

³ Department of Pediatrics, Rwanda Environment Management Authority (REMA)

Published: 27 January 2007 | **Received:** 10 November 2006 | **Accepted:** 12 January 2007

Correspondence: inyiramwami@yahoo.com

DOI: [10.5281/zenodo.18854018](https://doi.org/10.5281/zenodo.18854018)

Author notes

Ingirih Nyiramwami is affiliated with Department of Pediatrics, University of Rwanda and focuses on Medicine research in Africa.

Kabuye Nshuti is affiliated with University of Rwanda and focuses on Medicine research in Africa.

Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of community health centres systems in Rwanda: panel-data estimation for measuring system reliability in Rwanda. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. 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 community health centres systems in Rwanda: panel-data estimation for measuring system reliability, Rwanda, Africa, Medicine, short report This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Rwanda, Health Systems, Panel Data, Evaluation Methods, System Reliability, Geographic Medicine, Quantitative Analysis

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