



Methodological Evaluation of Community Health Centre Systems in Senegal: Panel Data Estimation for Measuring System Reliability,

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Published: 16 March 2005 | **Received:** 28 November 2004 | **Accepted:** 10 February 2005

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DOI: [10.5281/zenodo.18807040](https://doi.org/10.5281/zenodo.18807040)

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Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of community health centres systems in Senegal: panel-data estimation for measuring system reliability in Senegal. 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 Senegal: panel-data estimation for measuring system reliability, Senegal, Africa, Medicine, case study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, geographical, econometrics, panel-data, reliability, healthcare-systems, statistical-analysis*

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