



Reliability Assessment in District Hospitals Systems: A Randomized Field Trial in South Africa

Kgosi Mkhize^{1,2}, Nomonde Dlamini^{3,4}, Yolandi Viljoen^{2,5}, Chipso Moyo⁶

¹ Department of Public Health, Stellenbosch University

² Department of Internal Medicine, University of Fort Hare

³ Department of Pediatrics, University of Fort Hare

⁴ Stellenbosch University

⁵ Nelson Mandela University

⁶ Department of Public Health, Nelson Mandela University

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Correspondence: kmkhize@gmail.com

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Author notes

Kgosi Mkhize is affiliated with Department of Public Health, Stellenbosch University and focuses on Medicine research in Africa.

Nomonde Dlamini is affiliated with Department of Pediatrics, University of Fort Hare and focuses on Medicine research in Africa.

Yolandi Viljoen is affiliated with Department of Internal Medicine, University of Fort Hare and focuses on Medicine research in Africa.

Chipso Moyo is affiliated with Department of Public Health, Nelson Mandela University and focuses on Medicine research in Africa.

Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of district hospitals systems in South Africa: randomized field trial for measuring system reliability in South Africa. 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 district hospitals systems in South Africa: randomized field trial for measuring system reliability, South Africa, Africa, Medicine, intervention study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, randomized, trial, evaluation, reliability, methodology, district, hospitals

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