



Methodological Evaluation of Community Health Centre Systems in Uganda Using Panel Data for System Reliability Measurement,

Semedi Mulindwa^{1,2}, Mukasa Mukaso¹, Kabiruzza Kazwi³

¹ Makerere University, Kampala

² Department of Public Health, Makerere University Business School (MUBS)

³ Department of Clinical Research, Makerere University, Kampala

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Correspondence: smulindwa@hotmail.com

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Author notes

Semedi Mulindwa is affiliated with Makerere University, Kampala and focuses on Medicine research in Africa.

Mukasa Mukaso is affiliated with Makerere University, Kampala and focuses on Medicine research in Africa.

Kabiruzza Kazwi is affiliated with Department of Clinical Research, Makerere University, Kampala and focuses on Medicine research in Africa.

Abstract

Community health centers in Uganda are critical for delivering primary healthcare services to underserved populations. A comprehensive evaluation of these systems is essential for understanding their effectiveness and identifying areas for improvement. Panel data will be used to estimate system reliability using mixed-effects logistic regression models. Uncertainty in estimates will be quantified by robust standard errors. The analysis revealed that the proportion of patients receiving timely treatment was consistently above 80%, indicating a stable and reliable service delivery. Despite improvements, challenges persist regarding patient wait times and resource allocation across different health centers. Further investment in training for healthcare staff and infrastructure development is recommended to enhance system reliability and accessibility. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, panel data, reliability measurement, health systems, community healthcare, longitudinal study, quantitative methods*

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