



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

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**Published:** 19 January 2007 | **Received:** 27 October 2006 | **Accepted:** 12 December 2006

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**DOI:** [10.5281/zenodo.18844196](https://doi.org/10.5281/zenodo.18844196)

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## Abstract

Community health centres in Ghana face challenges related to service delivery and resource allocation. Panel data methodology was employed to assess system reliability. The study used time-series data from multiple community health centres in Ghana over a five-year period. Patient wait times showed an average reduction of 15% across the sampled centres, with significant variability between districts ( $p < 0.05$ ). The analysis indicated that while there was improvement in patient flow, further intervention is required to ensure consistent system reliability. Investment in technology and training for staff could enhance service delivery and reduce wait times. Community health centres, Ghana, panel data, system reliability, patient flow 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 assessment, community health centres, resource allocation, service delivery, econometric methods

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