



# Methodological Evaluation of District Hospitals Systems in Ethiopia Using Multilevel Regression Analysis to Assess System Reliability

Methodological  
Evaluation of District  
Hospitals Systems

DOI

[10.5281/zenodo.18806](https://doi.org/10.5281/zenodo.18806289)

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Received 13 August 2004

Accepted 07 December 2004

## Abstract

District hospitals in Ethiopia play a critical role in healthcare delivery, particularly for reproductive health services, gender issues, and HIV prevention and treatment. A systematic review was conducted to assess the methodological rigor of studies evaluating district hospitals in Ethiopia. Multilevel regression analysis was employed to measure system reliability. Findings from the reviewed papers indicated that variability existed within and between districts, with some areas reporting higher levels of service provision than others. The multilevel regression analysis revealed significant differences in system performance across regions, highlighting the need for targeted interventions to improve reliability. District health authorities should prioritise resource allocation based on data-driven insights to enhance service delivery and reduce disparities. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** African healthcare, district hospitals, Ethiopia, multilevel modelling, system reliability, regression analysis, geographic information systems, spatial analysis

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