



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

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Abstract

Ethiopia's district hospitals are crucial for healthcare delivery at a local level. However, their operational and management systems vary widely in terms of reliability and effectiveness. Multilevel regression analysis was employed to analyse data from Ethiopian district hospitals. The model includes fixed effects for hospital-level variables and random effects for geographical clustering. The model revealed that the proportion of patients adhering to treatment protocols varied significantly across districts, with a mean adherence rate of 78% in urban areas compared to 65% in rural regions. Multilevel regression analysis provided insights into system reliability but highlighted disparities between urban and rural settings. Further research should focus on developing tailored interventions for enhancing protocol adherence in underserved rural districts. district hospitals, Ethiopia, multilevel regression, system reliability, patient adherence Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Ethiopia, District Hospitals, Multilevel Analysis, Reliability Assessment, Healthcare Systems, Methodology, Evaluation Framework

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