



Methodological Evaluation of District Hospitals Systems in Rwanda Using Panel Data for System Reliability Measurement,

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Abstract

Rwanda's district hospitals play a critical role in healthcare delivery but require methodological evaluation to enhance their reliability and effectiveness. A systematic literature review was conducted using a mixed-method approach including peer-reviewed articles from databases such as PubMed and Web of Science. Data analysis employed multilevel modelling to assess district-level health outcomes over time. Panel data showed significant variation in hospital performance across districts, with some showing improvements over the study period, indicating potential for targeted interventions. The evaluation highlighted methodological gaps and suggested a need for standardised monitoring tools at district level to improve system reliability. Standardised monitoring tools should be developed and implemented across Rwanda's district hospitals to ensure consistent performance evaluations. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, District Hospitals, Methodology, Panel Data, Reliability, Evaluation*

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