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Methodological Assessment of District Hospital Systems in Uganda Using Bayesian Hierarchical Models for System Reliability Assessment

Ssesamuzi Musoke[1], **Mukasa Nakawala**[2], **Wabakweekwa Mulumba**[2,3]

[1] Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

[2] Uganda Christian University, Mukono

[3] Department of Surgery, Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

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Correspondence: smusoke@hotmail.com

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Author notes

Ssesamuzi Musoke is affiliated with Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit and focuses on Medicine research in Africa.

Mukasa Nakawala is affiliated with Uganda Christian University, Mukono and focuses on Medicine research in Africa.

Wabakweekwa Mulumba is affiliated with Uganda Christian University, Mukono and focuses on Medicine research in Africa.

Abstract

District hospitals in Uganda play a crucial role in healthcare delivery, but their operational efficiency varies significantly. A systematic literature review was conducted to identify relevant studies on district hospitals' performance metrics. The analysis employed Bayesian hierarchical modelling to aggregate data from multiple sources, providing insights into overall system reliability. The findings suggest that approximately 60% of the districts have systems with moderate reliability levels, indicating areas for improvement in resource allocation and operational practices. Bayesian hierarchical models offer a robust framework for assessing district hospital systems' reliability, highlighting opportunities for targeted interventions to enhance service delivery. District health authorities should prioritise investments in training staff and infrastructure to improve system performance and patient outcomes. district hospitals, Bayesian hierarchical model, system reliability, Uganda Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\ p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Bayesian, Hierarchical, Evaluation, Methodology, Reliability, Uganda*

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