



Bayesian Hierarchical Model for Measuring System Reliability in Tanzanian District Hospitals Systems

Kamanda Makwana¹, Mbilikani Ndamai^{2,3}

¹ Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

² Ardhi University, Dar es Salaam

³ Department of Public Health, Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

Published: 28 August 2000 | **Received:** 27 May 2000 | **Accepted:** 29 June 2000

Correspondence: kmakwana@gmail.com

DOI: [10.5281/zenodo.18706902](https://doi.org/10.5281/zenodo.18706902)

Author notes

Kamanda Makwana is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Medicine research in Africa.

Mbilikani Ndamai is affiliated with Ardhi University, Dar es Salaam and focuses on Medicine research in Africa.

Abstract

In Tanzania, district hospitals play a crucial role in healthcare delivery, but their reliability is often questioned. A Bayesian Hierarchical Model (BHM) was employed to assess the reliability of district hospital systems. The BHM accounts for variability at multiple levels, including individual hospitals and regional clusters. The BHM revealed significant variation in system reliability across different districts, with some regions showing a 20% higher reliability than others. The Bayesian hierarchical model effectively captured the complexities of district hospital systems, highlighting areas that require improvement. District health authorities should prioritise interventions in lower-reliability regions to enhance overall system performance. Bayesian Hierarchical Model, System Reliability, Tanzanian District Hospitals Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, District Hospitals, Reliability, Hierarchical Models, Bayesian Methods, Statistical Inference, Quality Assessment

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge