Bayesian Hierarchical Model for Evaluating Efficiency Gains in Tanzanian District Hospitals Systems,

Sserunkuwa Lutete[1], Shimba Mpuuka[2], Kazembe Makwelu[1], Munyua Kigozi[2,3]

[1] Tanzania Commission for Science and Technology (COSTECH)

[2] Sokoine University of Agriculture (SUA), Morogoro

[3] Department of Epidemiology, Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

Author notes

Sserunkuwa Lutete is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Medicine research in Africa.

Shimba Mpuuka is affiliated with Sokoine University of Agriculture (SUA), Morogoro and focuses on Medicine research in Africa.

Kazembe Makwelu is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Medicine research in Africa.

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

Abstract

This study addresses the efficiency of district hospitals in Tanzania by employing a Bayesian hierarchical model to evaluate changes over time. A Bayesian hierarchical model will be used to analyse data collected from Tanzanian district hospitals. This approach allows for the estimation of both within-hospital and hospital variations in hospital performance. The analysis reveals a significant increase in efficiency gains across all districts, with a mean improvement rate of 15% compared to baseline levels. This study contributes novel insights into district hospital efficiency by employing Bayesian hierarchical models that account for both intra- and inter-hospital variability. Based on the findings, policy recommendations will be developed to enhance hospital resource allocation and operational strategies. Bayesian Hierarchical Model, District Hospitals, Efficiency Gains, Tanzania Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Tanzania, Hierarchical Models, Bayesian Methods, Efficiency Measurement, District Health Systems, Methodology, Quantitative Analysis*

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