



Bayesian Hierarchical Model for Evaluating Efficiency Gains in South African District Hospitals Systems

Loyiso Mokgohlobo¹, Mpho Leketela², Nkosana Khumalo^{2,3}

¹ Department of Surgery, SA Medical Research Council (SAMRC)

² Department of Epidemiology, University of Venda

³ SA Medical Research Council (SAMRC)

Published: 05 October 2013 | **Received:** 10 May 2013 | **Accepted:** 10 August 2013

Correspondence: lmokgohlobo@aol.com

DOI: [10.5281/zenodo.18987217](https://doi.org/10.5281/zenodo.18987217)

Author notes

Loyiso Mokgohlobo is affiliated with Department of Surgery, SA Medical Research Council (SAMRC) and focuses on Medicine research in Africa.

Mpho Leketela is affiliated with Department of Epidemiology, University of Venda and focuses on Medicine research in Africa.

Nkosana Khumalo is affiliated with SA Medical Research Council (SAMRC) and focuses on Medicine research in Africa.

Abstract

District hospitals in South Africa play a crucial role in primary healthcare delivery. However, their operational efficiency varies significantly, necessitating methodological evaluation to improve service quality and resource allocation. A Bayesian hierarchical model was employed to analyse data from multiple district hospitals. The model accounts for heterogeneity in hospital performance and incorporates robust uncertainty estimates through credible intervals. The analysis revealed that the efficiency gains across districts varied, with some hospitals achieving substantial improvements in their operational effectiveness. This study demonstrates the utility of Bayesian hierarchical models in assessing district hospital systems' efficiency. The findings provide actionable insights for policymakers aiming to enhance healthcare service delivery. Policymakers should prioritise interventions targeting specific areas identified as needing improvement, such as resource allocation and staff training, based on this analysis. 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: *Sub-Saharan, hierarchical modelling, Bayesian statistics, healthcare systems, district hospitals, efficiency metrics, econometrics*

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