



# Methodological Evaluation of District Hospitals Systems in South Africa Using Bayesian Hierarchical Models for Cost-effectiveness Analysis

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## Abstract

District hospitals in South Africa play a crucial role in healthcare delivery, particularly in underserved areas. However, their effectiveness and cost-effectiveness are not well understood. A systematic literature review was conducted, focusing on studies that applied Bayesian hierarchical models for cost-effectiveness analysis in South African district hospitals. The review included articles published between and . The findings indicate that while Bayesian hierarchical models have been used to analyse hospital systems' performance, there is variability in the application of these models across studies. Bayesian hierarchical models offer a robust method for assessing cost-effectiveness but require careful consideration of model assumptions and data quality. Future research should standardise the use of Bayesian hierarchical models by providing guidelines on model specification, data collection methods, and reporting standards. district hospitals, South Africa, cost-effectiveness, Bayesian hierarchical models, healthcare systems Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, district hospitals, cost-effectiveness, Bayesian statistics, hierarchical models, econometric analysis, health economics*

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