African Public Health Nursing

# Bayesian Hierarchical Model for Measuring Adoption Rates in South African District Hospital Systems,

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## Abstract

District hospitals in South Africa have faced challenges in adopting evidence-based practices, necessitating a methodological evaluation to enhance their effectiveness. A Bayesian hierarchical model was applied across multiple hospitals to measure the adoption rates of specific medical interventions. Uncertainty in estimates is addressed through robust standard errors and confidence intervals. The analysis revealed that adoption rates varied significantly between different district hospitals, with some areas showing adoption rates as high as 80% for certain practices. This study demonstrates the utility of Bayesian hierarchical models in evaluating medical practice adoption within South African district hospital systems. Further research should explore factors influencing adoption rates and potential interventions to enhance consistent implementation across all hospitals. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, Bayesian, Hierarchical, Meta-analysis, Evidence-based, Quantitative, Evaluation*

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