African Animal Physiology (Agri/Animal Science)

Bayesian Hierarchical Model for Evaluating Efficiency Gains in Nigeria's District Hospitals System

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Abstract

This study addresses a current research gap in Medicine concerning Methodological evaluation of district hospitals systems in Nigeria: Bayesian hierarchical model for measuring efficiency gains in Nigeria. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of district hospitals systems in Nigeria: Bayesian hierarchical model for measuring efficiency gains, Nigeria, Africa, Medicine, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Treatment effect was estimated with $text{logit}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Nigerian, Hierarchical, Bayesian, Efficiency, Evaluation, Methodology, Quantitative*

ABSTRACT-ONLY PUBLICATION

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