African Disability Studies (Interdisciplinary - Social/Health/Policy)

Bayesian Hierarchical Model for Evaluating Maternal Care Systems in Kenya: A Focus on Clinical Outcomes

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Abstract

Maternal care systems in Kenya face challenges related to clinical outcomes, necessitating a methodological evaluation to improve service quality and patient safety. A Bayesian hierarchical model was applied to assess the effectiveness of different maternal care facilities across Kenya. The model accounts for variability within and between regions, incorporating data from multiple sources including health records and patient surveys. The analysis revealed significant regional variations in clinical outcomes, with a notable improvement (25%) observed in facility A compared to baseline levels, indicating the effectiveness of targeted interventions. Bayesian hierarchical models offer a robust framework for evaluating maternal care systems and identifying areas that require further attention. The findings highlight the importance of standardised data collection and regional-specific strategies in enhancing clinical outcomes. Enhanced training programmes should be implemented, focusing on regions with lower performance indices. Additionally, regular audits and quality improvement initiatives are recommended to maintain high standards of care. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Kenya, Bayesian Hierarchical Model, Maternal Care Systems, Clinical Outcomes, Methodology, Africa Healthcare Systems, Quantitative Analysis*

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