



Methodological Evaluation and Forecasting Model of Maternal Care Facilities in South Africa: A Meta-Analysis

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Abstract

Maternal care facilities in South Africa face challenges in maintaining consistent quality of care. A meta-analysis approach was employed to synthesize existing data on maternal care systems, including systematic reviews, randomized controlled trials, and observational studies. The analysis utilised statistical software for model building and validation. The findings indicate a significant variation in the implementation of quality assurance measures across facilities ($p < 0.05$), with some areas showing improvement over time but others needing reinforcement. This study highlights the importance of standardised protocols in improving clinical outcomes and suggests that regular audits can lead to better performance, supported by robust statistical models. Facilities should prioritise ongoing quality assurance initiatives and engage in regular updates based on model predictions for enhancing patient safety and health outcomes. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Quality of Care, Meta-analysis, Systematic Review, Randomized Controlled Trials, Hierarchical Linear Modelling, Bayesian Statistics*

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