



# Bayesian Hierarchical Model for Assessing Clinical Outcomes in Urban Primary Care Networks in Kenya: A Meta-Analysis

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**Published:** 08 April 2009 | **Received:** 10 January 2009 | **Accepted:** 26 February 2009

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**DOI:** [10.5281/zenodo.18885669](https://doi.org/10.5281/zenodo.18885669)

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## Abstract

Urban primary care networks in Kenya have been established to improve healthcare access and outcomes for a significant portion of the population. However, their effectiveness remains unclear due to variability across different settings. A comprehensive review of existing studies was conducted, focusing on clinical outcomes such as patient satisfaction and health improvement. Data were analysed using a Bayesian hierarchical model with robust standard errors to account for variability across sites and individual-level effects. The analysis revealed significant heterogeneity in clinical outcomes between primary care networks, indicating the need for tailored interventions based on site-specific conditions. This study provides evidence that a Bayesian hierarchical model is effective in assessing clinical outcomes in urban primary care networks. The findings highlight the importance of local adaptation and monitoring to optimise network performance. Health policymakers should consider implementing these findings into future planning, with a focus on supporting site-specific improvements based on observed effectiveness. Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Kenya, Primary Care Networks, Bayesian Hierarchical Models, Meta-Analysis, Methodological Evaluation, Clinical Outcomes, Geographic Analysis

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