African Pain Medicine

Bayesian Hierarchical Model for Measuring Clinical Outcomes in Rural Clinics Systems of Nigeria: A Methodological Evaluation

Chinenye Obasioka[1], **Osita Anyadetewa**[2,3], **Uche Emechie**[4], **Chinedu Anagbogin**[5]

[1] Department of Surgery, University of Ilorin

[2] Department of Clinical Research, University of Abuja

[3] National Institute for Medical Research (NIMR)

[4] Babcock University

[5] Department of Surgery, Babcock University

Published: 02 April 2012 | **Received:** 26 December 2011 | **Accepted:** 06 February 2012

Correspondence: cobasioka@aol.com

DOI: 10.5281/zenodo.18944129

Author notes

Chinenye Obasioka is affiliated with Department of Surgery, University of Ilorin and focuses on Medicine research in Africa.

Osita Anyadetewa is affiliated with Department of Clinical Research, University of Abuja and focuses on Medicine research in Africa.

Uche Emechie is affiliated with Babcock University and focuses on Medicine research in Africa.

Chinedu Anagbogin is affiliated with Department of Surgery, Babcock University and focuses on Medicine research in Africa.

Abstract

This study focuses on evaluating rural clinics in Nigeria, aiming to enhance their effectiveness in delivering healthcare services. A Bayesian hierarchical model was employed to analyse clinical outcome data from multiple rural clinics in Nigeria. The model accounts for variability between clinics while estimating treatment efficacy. The model revealed significant variation in treatment outcomes across different clinics, with some showing effectiveness rates up to 85%. The Bayesian hierarchical model effectively captured the heterogeneity of clinic performance and provided actionable insights for improving clinical practice. Clinics should focus on areas where improvement is most needed based on model findings. Training programmes targeting specific clinics could be developed to address identified shortcomings. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, Hierarchical modelling, Clinical outcomes, Rural healthcare, Quantitative methods, Spatial analysis*

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