Bayesian Hierarchical Model Assessment of Community Health Centre Systems in Kenya: A Methodological Evaluation

Mwangi Kinyanjui[1,2]**, Kisitu Mutai**[1]

[1] International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

[2] University of Nairobi

Correspondence: mkinyanjui@aol.com

Author notes

Mwangi Kinyanjui is affiliated with International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Medicine research in Africa.

Kisitu Mutai is affiliated with International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Medicine research in Africa.

Abstract

Community health centres (CHCs) in Kenya are critical for delivering healthcare services to underserved populations. However, their performance and reliability vary significantly across different regions. A Bayesian hierarchical model was employed to assess the reliability of community health centres (CHCs) across Kenya. The model incorporates spatial and temporal dependencies to account for regional differences and temporal trends. The analysis revealed significant variation in system reliability between regions, with some areas experiencing up to a 30% higher failure rate compared to others. Bayesian hierarchical models provide valuable insights into the variability of CHC systems across Kenya. This novel method can aid in targeted interventions to improve service delivery and patient outcomes. Health policymakers should consider regional differences when planning health resource allocation, particularly focusing on areas with higher failure rates identified by this model. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Bayesian Hierarchical Models, Community Health Centres, Methodological Evaluation, Quantitative Methods, Spatial Analysis, Statistical Modelling*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge