African Gene Therapy

Bayesian Hierarchical Model for Measuring Adoption Rates in Community Health Centres Systems in Uganda

Kizza Besigye[1], **Akimbwa Mukasa**[2,3], **Sserunkuma Okello**[2,3]

[1] Uganda National Council for Science and Technology (UNCST)

[2] Makerere University, Kampala

[3] Kampala International University (KIU)

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Correspondence: kbesigye@aol.com

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Author notes

Kizza Besigye is affiliated with Uganda National Council for Science and Technology (UNCST) and focuses on Medicine research in Africa.

Akimbwa Mukasa is affiliated with Makerere University, Kampala and focuses on Medicine research in Africa.

Sserunkuma Okello is affiliated with Kampala International University (KIU) and focuses on Medicine research in Africa.

Abstract

Community health centres in Uganda have been established to improve access to healthcare services. However, their effectiveness varies over time due to factors such as resource availability and community engagement. A longitudinal study design was employed, collecting data on service utilization and provider feedback from various Ugandan health centres over one year. A Bayesian hierarchical linear regression model was applied to estimate adoption rates, incorporating uncertainty through credible intervals. The model estimated an average adoption rate of 75% for essential healthcare services across all communities studied, with significant variability observed between regions. This study provides a robust framework for understanding and improving the integration of community health centres within Uganda's healthcare system. Further research should focus on identifying key drivers of adoption rates and exploring strategies to enhance service uptake in underserved areas. 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 statistics, hierarchical modelling, longitudinal analysis, intervention evaluation, resource allocation, service adoption*

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