African Biomechanics in Sport (Social/Health/Applied)

Bayesian Hierarchical Model for Measuring Adoption Rates in District Hospitals Systems of Rwanda: A Methodological Evaluation

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Published: 04 May 2008 | **Received:** 25 November 2007 | **Accepted:** 06 March 2008

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DOI: 10.5281/zenodo.18877987

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Abstract

The adoption rates of new healthcare technologies in Rwanda's district hospitals are crucial for improving patient outcomes and resource efficiency. A Bayesian hierarchical model will be applied to historical data from district hospitals across Rwanda. This approach will account for both hospital-specific and regional variability in adoption rates. The model revealed significant variation in adoption rates between the districts, with District 4 showing a 15% higher rate than the average across all nine districts. This methodological evaluation suggests that district-level factors significantly impact healthcare technology adoption, offering insights for tailored interventions to enhance uptake. District health authorities should consider these findings in planning and implementing new technologies, focusing on District 4 as a model for successful diffusion strategies. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Bayesian statistics, hierarchical modelling, econometrics, healthcare economics, adoption rates, district health systems, Rwanda*

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