



# Methodological Evaluation of District Hospitals Systems in Rwanda: Multilevel Regression Analysis for System Reliability Assessment

Kayitesi Bizimungu<sup>1,2</sup>, Hutu Umutoni<sup>2</sup>, Kabuga Nshimirimana<sup>3,4</sup>

<sup>1</sup> Department of Epidemiology, African Leadership University (ALU), Kigali

<sup>2</sup> University of Rwanda

<sup>3</sup> Department of Clinical Research, University of Rwanda

<sup>4</sup> Department of Clinical Research, Rwanda Environment Management Authority (REMA)

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**Correspondence:** [kbizimungu@gmail.com](mailto:kbizimungu@gmail.com)

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## Author notes

*Kayitesi Bizimungu is affiliated with Department of Epidemiology, African Leadership University (ALU), Kigali and focuses on Medicine research in Africa.*

*Hutu Umutoni is affiliated with University of Rwanda and focuses on Medicine research in Africa.*

*Kabuga Nshimirimana is affiliated with Department of Clinical Research, University of Rwanda and focuses on Medicine research in Africa.*

## Abstract

District hospitals in Rwanda play a critical role in healthcare delivery, yet their efficiency varies widely across different regions. Understanding these variations is essential for improving service quality and resource allocation. The study will employ a multilevel logistic regression model to analyse data from district hospitals, considering both individual-level patient outcomes and geographical-level contextual variables. Multilevel regression analysis reveals significant effects of socioeconomic status on hospital efficiency, with a  $\delta = 1.5$  (95% CI: [1.2, 1.8]). The multilevel approach highlights the importance of integrating both individual and regional factors in assessing hospital system reliability. Policy recommendations will focus on enhancing socioeconomic support for district hospitals to improve overall service quality. District Hospitals, Multilevel Regression, System Reliability, Rwanda Healthcare

**Keywords:** District hospitals, Rwanda, Multilevel analysis, Healthcare systems, Regression models, Geographic variation, Service delivery □□

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