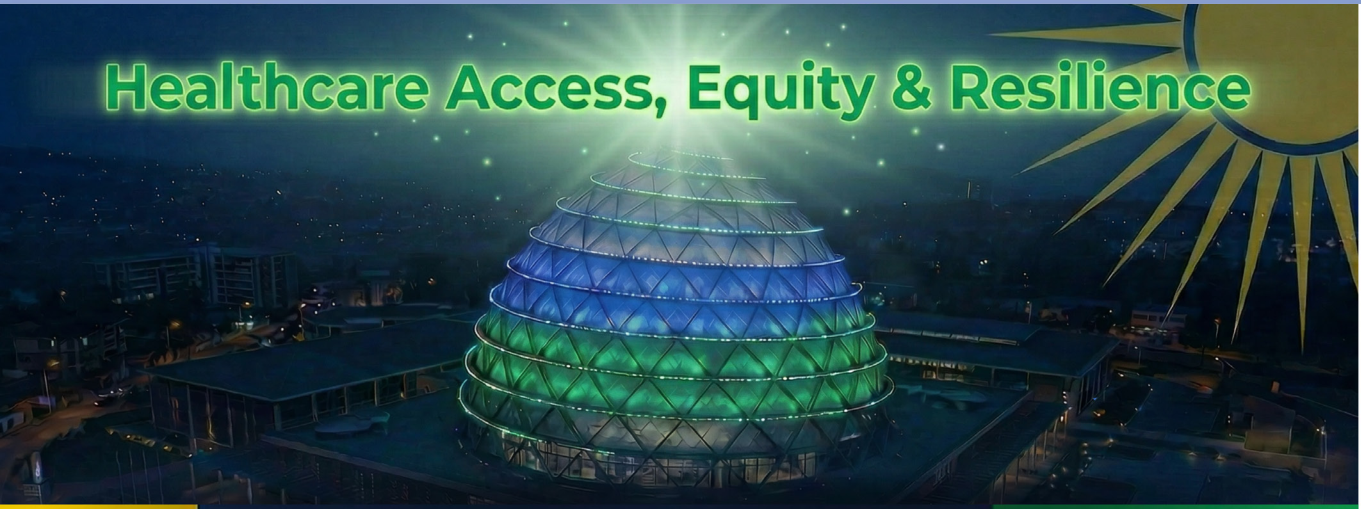
Rwanda
Public Health Bulletin

Vol. 7 (1); March 2026

Online ISSN: 2663-4651
Print ISSN: 2662-4643



Healthcare Access, Equity & Resilience

HIGHLIGHTS

1. Determinants of Mental Health Service Use in Rwandan Youth
2. Healthcare Utilization and Equity under UHC in Rwanda
3. Parental Experiences with Pediatric Rehabilitation at CHUB
4. Evaluating Rwanda's Antimicrobial Resistance Policy Response
5. Impact of a Regional Anesthesia Block Room in Rwanda

Ministry of Health

Rwanda
Biomedical
Centre
Healthy People, Wealthy Nation

Rwanda
Public Health Bulletin

General Information

Rwanda Public Health Bulletin (RPHB) is an open-access and peer-reviewed bulletin published by Rwanda Biomedical Centre (RBC).

Its mission is to serve as a knowledge sharing platform for national and international public health scientific information. Content published under RPHB will be used to control and address potential public health outbreak threats and strengthen health systems through real time availability of information.

This will allow more and effective communication between policy makers, researchers and health practitioners.

A new issue is published quarterly with supplements and special reports. Publication materials are submitted online at https://www.rbc.gov.rw/publichealthbulletin/manuscripts/submission and should fulfil the RPHB's instructions.

Go to https://www.rbc.gov.rw/publichealthbulletin/about/instructions for instructions to authors.

Scientific scholars who would like to join RPHB and become peer reviewers are welcome. They can find more details at https://www.rbc.gov.rw/publichealthbulletin/about/reviewers

Publisher: Rwanda Biomedical Centre (RBC).

Online ISSN: 2663 - 4651, **Print ISSN:** 2663 - 4643

Contacts

Email: rwandapublichealtbulletin@gmail.com
Website: https://www.rbc.gov.rw/publichealthbulletin/

Address

Rwanda Public Health Bulletin Secretariat
KG 203St., City of Kigali, Rwanda

Acknowledgement

This publication, [Rwanda Public Health Bulletin (RPHB)], was made possible by financial support from the Bloomberg Philanthropies Data for Health Initiative through the CDC Foundation. Its contents are solely the responsibility of the authors and don't necessarily represent the official views of Bloomberg Philanthropies, the CDC Foundation or the U.S. Centers for Disease Control and Prevention.

Rwanda

Public Health Bulletin

EDITORS

Editor-in-Chief

Prof. Claude Mambo Muvunyi
Rwanda Biomedical Centre

Deputy Editor-in-Chiefs

Prof. Leon Mutesa
University of Rwanda

Managing Editors

Hon. Dr. Sabin Nsanzimana
Rwanda, Ministry of Health
Dr. Eric Remera
Rwanda Biomedical Centre
Dr. Clarisse Musanabaganwa
Rwanda Biomedical Centre
Dr. Christian Nsanzabaganwa
Rwanda Biomedical Centre

Desktop Publisher

Dr. Joel Gasana
Rwanda Biomedical Centre

Jean Bosco Ntirenganya
Rwanda Biomedical Centre

Editorial Board Members

Col. Dr. Tharcisse Mpunga
University Teaching Hospital, Kigali
Prof. Leatitia Nyirazinyoye
School of Public Health, UR
Prof. Aline Umubyeyi
School of Public Health, UR
Prof. Jacob Souopgui
Université Libre de Bruxelles
Dr. Patrick Migambi
Rwanda Biomedical Centre
Dr. Vincent Rusanganwa
Rwanda, Ministry of Health
Dr. Edson Rwagasore
Rwanda Biomedical Centre
Dr. Yvonne Kayiteshonga
University of Global Health Equity
CP. Dr. Daniel Nyamwasa
Kacyiru District Hospital
Dr. Jean Baptiste Mazarati
University of Global Health Equity
Dr. Muhammed Semakula
University of Rwanda

Dr. Albert Tuyishime
Rwanda Biomedical Centre
Dr. Aline Uwimana
Rwanda Biomedical Centre
Prof. Vincent Sezibera
University of Rwanda
Prof. David R. Hotchkiss
Tulane University
Prof. Nancy Mock
School of Public Health, UR
Dr. Vincent Mutabazi
Regional Alliance for Sustainable Development
Gregorie Muhorakeye
Rwanda Biomedical Centre
Dr. Christian Ntizimira
The African Center for Research on End of Life Care (ACREOL)
Arlette Umugwaneza
Rwanda Biomedical Centre
Hassan Mugabo
Rwanda Biomedical Centre

Hon. Dr. Ivan Butera
Rwanda, Ministry of Health
Dr. Angele Musabyimana
School of Public Health, UR
Prof. Jean Paul Rwabihama
University of Rwanda
Dr. Isabelle Mukagatare
Rwanda Biomedical Centre
Dr. Gallican RWIBASIRA
Rwanda Biomedical Centre
Dr. Francois Uwinkindi
Rwanda Biomedical Centre
Dr. Evaliste Ntaganda
Rwanda Biomedical Centre
Dr. Aimable Mbituyumuremyi
Rwanda Biomedical Centre
Marie Fidele Muremba
Fionet
James Kagame
Rwanda Biomedical Centre
Vincent Kwizera
Rwanda Cancer Centre

Dr. Jean Damascene Iyamuremye
Rwanda Biomedical Centre

Dr. Jean Nepomuscene Sindikubwabo
Rwanda Biomedical Centre

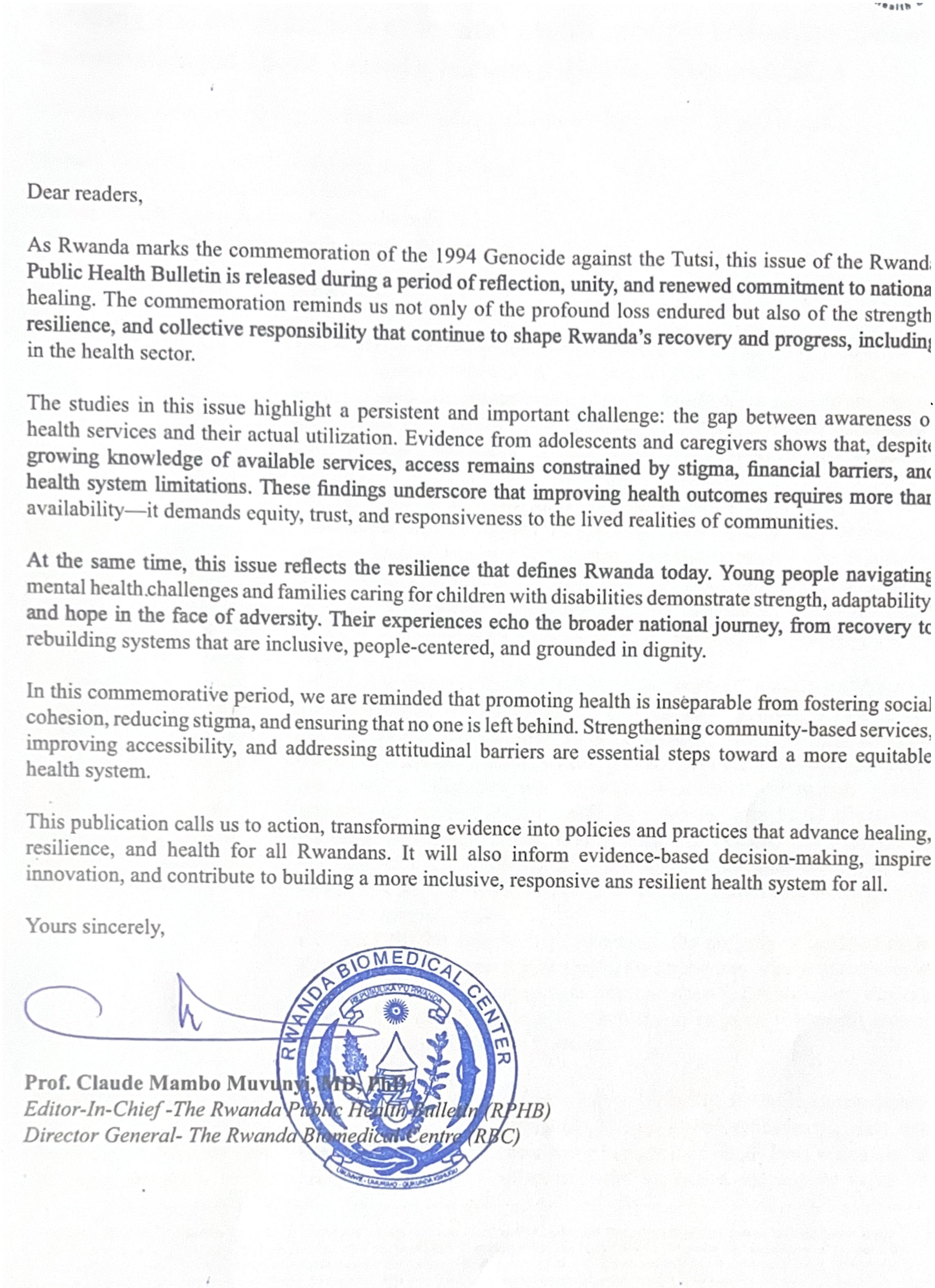
Jean de Dieu Ntivuguruzwa
World Bank

Rwanda
Public Health Bulletin

CONTENT

FOREWORD

ORIGINAL RESEARCH



Dear readers,

As Rwanda marks the commemoration of the 1994 Genocide against the Tutsi, this issue of the Rwand Public Health Bulletin is released during a period of reflection, unity, and renewed commitment to nationa healing. The commemoration reminds us not only of the profound loss endured but also of the strength resilience, and collective responsibility that continue to shape Rwanda's recovery and progress, includin in the health sector.

The studies in this issue highlight a persistent and important challenge: the gap between awareness o health services and their actual utilization. Evidence from adolescents and caregivers shows that, despit growing knowledge of available services, access remains constrained by stigma, financial barriers, an health system limitations. These findings underscore that improving health outcomes requires more tha availability—it demands equity, trust, and responsiveness to the lived realities of communities.

At the same time, this issue reflects the resilience that defines Rwanda today. Young people navigatin mental health challenges and families caring for children with disabilities demonstrate strength, adaptability and hope in the face of adversity. Their experiences echo the broader national journey, from recovery t rebuilding systems that are inclusive, people-centered, and grounded in dignity.

In this commemorative period, we are reminded that promoting health is inseparable from fostering social cohesion, reducing stigma, and ensuring that no one is left behind. Strengthening community-based services, improving accessibility, and addressing attitudinal barriers are essential steps toward a more equitable health system.

This publication calls us to action, transforming evidence into policies and practices that advance healing, resilience, and health for all Rwandans. It will also inform evidence-based decision-making, inspire innovation, and contribute to building a more inclusive, responsive ans resilient health system for all.

Yours sincerely,

Prof. Claude Mambo Muvunyi, MD, PhD
Editor-In-Chief -The Rwanda Public Health Bulletin (RPHB)
Director General- The Rwanda Biomedical Centre (RBC)

Original Research Open Access

Rwanda Public Health Bulletin

Assessing the determinants of mental health services utilization among adolescents aged 18–24 years in Kicukiro district, Rwanda, 2025

Marie Angele Gasangwa[1,2,*], Janvier Rukundo[1], Louange Bienvenu Byiringiro[1], Yves Gashugi[3,4]

[1]*Rwanda, Food & Drugs Authority, Kigali, Rwanda*
[2]*Mount Kenya University, Kigali, Rwanda*
[3]*Rwanda Psychological Society, Kigali, Rwanda*
[4]*University of Global Health Equity, Burera, Butaro, Rwanda*

***Corresponding author:**
Marie Angele Gasangwa

Mount Kenya University, Kigali, Rwanda

Email: arfico2012@gmail.com)

Received: January 15, 2026
Accepted: March 17, 2026
Published: March 31, 2026

Cite this article as: Gasangwa et al. Assessing the determinants of mental health services utilization among adolescents aged 18–24 years in Kicukiro district, Rwanda, 2025. *Rw. Public Health Bul. 2026. 7 (1): 7-19. https://dx.doi.org/10.4314/rphb.v7i1.1*

ABSTRACT

INTRODUCTION: Mental health disorders are a growing public health concern, particularly among adolescents aged 18–24 years. This study aimed to assess the determinants of mental health service utilization among adolescents aged 18–24 years in Kicukiro District, Rwanda, focusing on socio-demographic characteristics, knowledge, attitudes, and access to services.
METHODS: A quantitative analytical cross-sectional design of 384 adolescents was conducted in schools, youth centers, and community settings. Data were collected via structured questionnaires covering socio-demographics, mental health knowledge, attitudes, and service utilization. Descriptive statistics, chi-square tests, and multivariable logistic regression analyses were conducted using SPSS 25 to identify factors associated with service use.
RESULTS: Overall, 35.4% of adolescents reported having accessed mental health services, with depression (87.5%), anxiety (66.2%), and stress (55.9%) as the main reasons. Awareness of services was high (83.6%), but knowledge of specific access points, particularly digital platforms, was limited. Utilization was significantly associated with age, gender, and attitudes toward mental health. Adolescents aged 21–23 years were 3.8 times more likely to use services compared to those ≤20 years (AOR = 3.753; 95% CI: 1.861–7.570), while females had higher utilization than males (AOR = 5.810; 95% CI: 3.249–10.389). Positive attitudes strongly predicted service uptake.
CONCLUSION: Despite high awareness, the majority of adolescents in Kicukiro District do not access mental health services. Interventions should target attitude change, stigma reduction, and improved accessibility through community, school, and digital platforms to enhance adolescent mental health service utilization in Rwanda.

INTRODUCTION

Mental health disorders represent a significant and growing global public health concern, contributing substantially to morbidity, disability, and premature mortality. Recent global estimates indicate that nearly one in eight individuals lives with a mental disorder, with depression and anxiety being the most prevalent conditions among youth and young adults [1]. Suicide remains the fourth leading cause of death among individuals aged 15–29 years, highlighting the developmental vulnerability of older adolescents and emerging adults [1]. The age group of 18–24 years is a critical transitional period marked by identity exploration, increasing autonomy, academic and occupational pressures, and major social adjustments, all of which heighten susceptibility to mental health challenges [2].

The burden of mental health disorders is particularly pronounced in low- and middle-income countries (LMICs), where service availability and accessibility remain limited. Countries in Sub-Saharan Africa (SSA) allocate less than 1% of their national health budgets to mental health, and most report fewer than two mental health professionals per 100,000 population [3]. As a result, more than 75% of young people experiencing mental health problems in SSA do not receive professional care [4]. Barriers such as stigma, misinformation, low mental health literacy, economic constraints, and cultural preferences for traditional and religious healing practices continue to hinder help-seeking among adolescents [5]. Regional data from Kenya, Uganda, and Tanzania consistently show high prevalence of depression, anxiety, and psychological distress among adolescents, yet service utilization rates remain low due to stigma, limited awareness, and perceived lack of youth-friendly services [6–8].

Rwanda has made significant progress in strengthening its mental health care system through policy, community-based programming, and integration of mental health services within primary health care. The Rwanda Mental Health Strategic Plan (2020–2024) emphasizes decentralization, task-shifting, and youth mental health promotion, while national surveys indicate that approximately 20% of the population experiences mental health challenges including post-traumatic stress disorder, depression, and anxiety [9, 10]. Despite these efforts, the utilization of mental health services among adolescents remains low. Evidence shows that fewer than 13% of individuals with mental health needs seek professional support, and adolescents and young adults are the least likely to access available services [10, 11]. Factors such as stigma, financial limitations, service availability, and limited awareness continue to shape attitudes and behaviours surrounding mental health service use. Rapid urbanization, youth unemployment, substance use, academic pressures, and interpersonal violence contribute to heightened psychosocial stress among adolescents. Recent reports indicate that mental health conditions affect an estimated 36.7% of residents in the district, with a substantial burden among young people [12]. Although several community-based initiatives, such as the "Baho Neza" project, have sought to expand mental health awareness, reduce stigma, and improve access to care, utilization among adolescents remains disproportionately low, partly due to financial barriers, limited information about services, and perceived stigma [13]. These trends suggest the presence of systemic and community-level barriers that influence adolescents' willingness and ability to seek professional mental health support.

Recent studies across LMICs underscore the importance of understanding determinants of mental health service utilization, particularly among older adolescents, who often fall between child-focused and adult-focused mental health services [14, 15]. Factors influencing utilization include individual perceptions of need, mental health literacy, family support, economic factors, cultural beliefs, availability of youth-friendly services, confidentiality concerns, and trust in health providers [5, 8, 15, 16]. However, empirical evidence examining these determinants among adolescents aged 18–24 in Rwanda remains limited, despite increasing policy attention to youth mental health.

Given the high burden of mental health problems and the low level of service use in Kicukiro District, there is a critical need for localized evidence to understand the factors that shape mental health service utilization among adolescents aged 18–24 years. Identifying these determinants will provide essential insights for designing targeted interventions, strengthening district-level mental health programming, and informing national strategies aimed at improving adolescent mental health outcomes in Rwanda.

METHODS

Study Design

This study employed a quantitative analytical cross-sectional design to assess the determinants of mental health services utilization among adolescents and young adults aged 18–24 years. The design enabled the measurement of exposure variables and service utilization outcomes simultaneously within the study population, making it appropriate for identifying associations between individual, social, and health system factors and mental health service use.

Study Setting

The study was conducted in Kicukiro District, one of the three administrative districts of Kigali City, Rwanda. Kicukiro District is a rapidly urbanizing area characterized by mixed residential, commercial, and industrial zones, and a high concentration of adolescents and young adults. Data collection was conducted between July 5, 2025, to August 12, 2025, in selected schools, youth centers, community settings, and health facilities within the district.

Study Population

The study population consisted of adolescents and young adults aged 18–24 years who were residing in Kicukiro District at the time of data collection. This age group represents a critical developmental period during which many mental health conditions emerge, and service utilization decisions are formed. Participants were recruited from secondary schools, youth centers, community spaces, and health facilities to ensure diversity in socio-economic status, education level, and gender.

Inclusion and Exclusion Criteria

Participants were eligible if they were aged 18–24 years at the time of data collection, residents of Kicukiro District, Kigali City, present at selected schools, youth centers, community settings, or health facilities, able to comprehend and respond to the questionnaire in Kinyarwanda, English, or French, and provided written informed consent

Participants were excluded if they had severe mental or physical conditions that impaired their ability to participate, were not residents of Kicukiro District, unable to communicate in the study languages, and declined or withdrew consent during the study

Sampling Technique and Sample Size

A multistage sampling strategy was employed. First, sectors within Kicukiro District were considered as primary strata. At the second stage, cells were selected systematically as primary sampling units. At the third stage, schools, youth centers, and community settings within selected cells were identified purposively based on availability. Finally, eligible participants within each site were selected using systematic random sampling, ensuring proportional representation across locations and gender. At this final stage, systematic random sampling was applied within each selected site. The total number of eligible adolescents at each location was first determined, and a sampling interval (k) was calculated by dividing this number by the allocated sample size. A random starting point between 1 and k was then selected, after which every kth eligible participant was approached for inclusion. If a selected individual was ineligible or declined participation, the next eligible individual was invited to maintain the sampling sequence. This procedure ensured systematic participant selection while reducing selection bias.

Sample Size Determination

The sample size was calculated using Cochran's formula for estimating proportions, assuming a 95% confidence level, a margin of error of 5%, and an estimated prevalence of mental health service utilization of 50% due to the absence of precise district-level estimates.

$n=(Z^2 p(1-p))/e^2$

Where:

n = required sample size
$Z = 1.96$ (95% confidence level)
$p = 0.5$
$e = 0.05$

The minimum sample size was 384 participants. To account for potential non-response and incomplete questionnaires, a 10% adjustment was applied, resulting in a target sample size of 425 participants. We confirm that this adjustment was appropriate, as the final number of completed questionnaires was 384, reflecting an approximate 9.6% non-response rate, consistent with the planned adjustment.

The sample was proportionally distributed across selected cells and data collection sites, with measures taken to ensure equal representation of males and females, minimizing gender-related response bias.

Data Collection Tools

Data were collected using a structured questionnaire developed specifically for this study, informed by validated tools and previous studies on adolescent mental health service utilization. The questionnaire consisted of four sections: (1) socio-demographic characteristics (age, sex, education, employment, living arrangement); (2) knowledge of mental health and mental health services; (3) attitudes toward mental health services, including stigma, confidentiality, and perceived effectiveness; and (4) utilization of mental health services, including history of service use and perceived barriers

The questionnaire was pretested prior to data collection to ensure clarity, relevance, and cultural appropriateness.

Variables

Outcome Variable: The primary outcome variable was mental health services utilization, assessed by self-report of whether participants had ever accessed professional mental health services. Responses were dichotomized as: Yes (utilized services), and No (did not utilize services).

Independent Variables: Independent variables for this study included socio-demographic factors such as age, sex, education level, and employment status. In addition, participants' knowledge of mental health services and attitudes toward seeking and utilizing these services were considered. Other variables included perceived stigma, accessibility and affordability of mental health services, and social and family support factors, all of which were examined as potential determinants of mental health service utilization among adolescents and young adults.

Scoring and Cut-Off Justification

Knowledge was assessed using a composite score ranging from 14 to 28, as reflected in the categorized results (Low: 14–18; Moderate: 19–24; High: 25–28). Higher scores indicated greater knowledge of mental health services. Attitude toward mental health services was measured using a composite score ranging from 5 to 16, categorized as Negative (5–8), Neutral (9–12), and Positive (13–16), with higher scores indicating more favorable attitudes toward service utilization. The categorization was based on proportional distribution of the total possible scores. For knowledge, scores were divided into three levels (low, moderate, high) using equal interval grouping across the observed score range to ensure meaningful differentiation of knowledge levels. For attitude, the score range (5–16) was similarly divided into three ordinal categories representing negative, neutral, and positive orientations. This approach is consistent with standard practices in Knowledge–Attitude–Practice (KAP) studies, where composite scores are grouped into interpretable categories to facilitate comparison and regression modeling.

The use of categorized levels rather than a single 60% dichotomous cut-off allowed for more nuanced analysis of gradients in knowledge and attitude. The distribution of participants across these categories (as shown in Table 4) demonstrates sufficient variability, supporting their suitability for inferential analysis.

Data Collection Procedure

Data collection was conducted by trained research assistants. Enumerators received training on ethical research conduct, confidentiality, informed consent, and sensitivity when discussing mental health topics. Questionnaires were administered in private settings to ensure participant comfort and confidentiality. Participation was voluntary, and respondents were free to withdraw at any time without consequences.

Bias Control

Several strategies were employed to minimize bias. Gender-balanced recruitment was ensured, proportional sampling was applied across cells, and systematic random sampling reduced selection bias. Standardized training of data collectors and pretesting of tools minimized information bias.

Statistical Analysis

Data were entered and analyzed using SPSS 25. Descriptive statistics were computed using frequencies, percentages, means, and standard deviations. At the bivariate level, chi-square tests were used to assess associations between independent variables and mental health service utilization. Variables with a p-value <0.05 were entered into a multivariable logistic regression model to estimate adjusted odds ratios (AORs) and 95% confidence intervals. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the University of Rwanda, College of Medicine and Health Sciences Institutional Review Board, and authorization to conduct the study was granted by Kigali City authorities. Only adolescents aged 18–24 years were included in the study, ensuring that participants were legally able to provide consent themselves. Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity were strictly maintained, and all data were securely stored in compliance with Rwanda's Data Protection Law (Law No. 058/2021).

During data collection, participants who displayed distress or reported mental health concerns were provided with information and referral to appropriate mental health services, ensuring ethical support and safeguarding for all respondents.

RESULTS

Demographic and Socioeconomic Profile of Study Participants

Table 1 presents the socio-demographic characteristics of the 384 adolescents aged 18–24 years who participated in the study. The majority of participants were aged 21–23 years (47.9%), with younger (≤20 years, 27.3%) and older (24 years, 24.8%) adolescents also represented, reflecting a relatively balanced age distribution. Females comprised the larger proportion of the sample (61.5%), compared to 38.5% males, suggesting higher participation or availability among female adolescents in health-related research. Most respondents had attained tertiary or college education (65.9%), followed by secondary education (27.1%), with only a small proportion having completed primary education (7.0%).

Regarding occupation and residency, more than half of the participants were students (55.5%), with smaller proportions employed (33.1%) or unemployed (11.5%). Over half of the adolescents (54.2%) had lived in Kicukiro District for seven years or more, while the remaining participants had shorter durations of residence. Overall, the study population was predominantly female, relatively well-educated, and long-term residents, factors that are likely to influence mental health awareness, attitudes, and service utilization

Table 1: *Demographic and Socioeconomic Profile of Study Participants (N=384)*

Variable	Category	Frequency	Percent (%)
Age	18-20 years	105	27.3
	21–23 years	184	47.9
	24 years	95	24.8
	Total	**384**	**100.0**
Gender	Male	148	38.5
	Female	236	61.5
	Total	**384**	**100.0**
Education Level	Primary	27	7.0
	Secondary	104	27.1
	Tertiary/College	253	65.9
	Total	**384**	**100.0**
Occupation	Student	213	55.5
	Employed	127	33.1
	Unemployed	44	11.5
	Total	**384**	**100.0**
Duration of Stay in Kicukiro	< 1 year	49	12.7
	2–3 years	83	21.6
	4–6 years	44	11.5
	≥ 7 years	208	54.2
	Total	**384**	**100.0**

patterns among adolescents in this district (see Table 1 for full details).

Utilization Level of Mental Health Services

Out of the 384 respondents, 136 (35.4%) reported having accessed mental health services at least once, while 248 (64.6%) indicated that they had never sought any mental health services. These findings indicate that although slightly more than one-third of adolescents have utilized mental health services, the majority, nearly two-thirds, have not.

Reasons for Seeking Mental Health Services

Among the 384 adolescents in the study, 136 participants (35.4%) reported having utilized mental health services and indicated their reasons for seeking care. The most commonly cited reason was depression, reported by 119 participants (87.5%), followed by anxiety (n = 90; 66.2%) and stress (n = 76; 55.9%). These results suggest that internalizing mental health conditions, particularly mood- and anxiety-related symptoms, are the primary drivers of service utilization among adolescents in Kicukiro District.

Psychosocial stressors were also significant contributors to help-seeking. Family-related issues were reported by 60 participants (44.1%), self-esteem problems by 54 participants (39.7%), and peer-related challenges by 47 respondents (34.6%). Additionally, 42 participants (30.9%) indicated substance abuse–related concerns, and 43 participants (31.6%) reported other unspecified reasons (Table 2).

Awareness and Knowledge of Mental Health Services and Access Points

Table 3 summarizes adolescents' awareness and knowledge of mental health services and access points in Kicukiro District. Overall, general awareness was high, with 321 participants (83.6%) reporting knowledge of mental health services, while 63 (16.4%) indicated no awareness. Counseling services were the most widely recognized (n = 262; 68.2%), followed by individual or group therapy (n = 244; 63.5%), psychiatric services (n = 227; 59.1%), helplines (n = 213; 55.5%), and support groups (n = 204; 53.1%). Fewer participants (n = 177; 46.1%) were aware of other mental health services, indicating variation in familiarity with the range of services available.

In terms of access points, health centers were most commonly identified (n = 309; 80.5%), followed by private clinics (n = 284; 74.0%) and hospitals (n = 275; 71.6%). Community centers (n = 267;

Table 2: *Main Reasons for Seeking Mental Health Services Among Adolescents (N = 384)*

Reason for Seeking Services	Response	Frequency	Percent (%)	Total (N=136) %
Anxiety	Yes	90	23.4	66.2
	No	46	12.0	33.8
Depression	Yes	119	31.0	87.5
	No	17	4.4	12.5
Stress	Yes	76	19.8	55.9
	No	60	15.6	44.1
Family issues	Yes	60	15.6	44.1
	No	76	19.8	55.9
Peer-related issues	Yes	47	12.2	34.6
	No	89	23.2	65.4
Self-esteem issues	Yes	54	14.1	39.7
	No	82	21.4	60.3
Substance abuse	Yes	42	10.9	30.9
	No	94	24.5	69.1
Other (specified)	Yes	43	11.2	31.6
	No	93	24.2	68.4

69.5%) and religious institutions (n = 244; 63.5%) were also frequently mentioned. Awareness of online platforms was lower (n = 163; 42.4%), and 127 participants (33.1%) reported uncertainty about where to access services.

Association of Participants' Characteristics, Knowledge, and Attitude with Mental Health Service Utilization

Table 4 shows statistically significant associations were observed between certain socio-demographic factors and mental health service utilization. Older adolescents, particularly those aged 21–23 years and 24 years, were more likely to report using mental health services compared to those aged 20 years or below ($\chi^2 = 14.424$, p = 0.001). Gender was also significant, with female participants demonstrating higher service utilization than males ($\chi^2 = 38.813$, p = 0.001). Duration of residence in Kicukiro District was another significant factor, as adolescents living in the district for seven years or more were more likely to have accessed services than those with shorter residency ($\chi^2 = 9.348$, p = 0.025). In contrast, education level, occupation, and residence status were not significantly associated with service use, suggesting these factors did not independently influence help-seeking behavior (see Table 2 for full details).

Table 2: *Awareness and Knowledge of Mental Health Services and Access Points Among Adolescents in Kicukiro District, Rwanda (N=384)*

Variable	Response	Frequency	Percent (%)
Awareness of mental health services	Yes	321	83.6
	No	63	16.4
Counseling services	Yes	262	68.2
	No	122	31.8
Therapy (Individual or group)	Yes	244	63.5
	No	140	36.5
Psychiatric services	Yes	227	59.1
	No	157	40.9
Helplines	Yes	213	55.5
	No	171	44.5
Support groups	Yes	204	53.1
	No	180	46.9
Other services	Yes	177	46.1
	No	207	53.9
Health centers	Yes	309	80.5
	No	75	19.5
Hospitals	Yes	275	71.6
	No	109	28.4
Private clinics	Yes	284	74.0
	No	100	26.0
Community centers	Yes	267	69.5
	No	117	30.5
Religious institutions	Yes	244	63.5
	No	140	36.5
Online platforms	Yes	163	42.4
	No	221	57.6
I do not know	Yes	127	33.1
	No	257	66.9

Respondents could select multiple options for service types and access points; percentages may not sum to 100%.

Psychosocial factors showed that knowledge of mental health services was not significantly associated with utilization ($\chi^2 = 3.300$, $p = 0.192$), indicating awareness alone may not drive service use. Attitudes toward mental health services, however, were strongly associated with utilization ($\chi^2 = 44.463$, $p = 0.001$), highlighting that positive perceptions and reduced stigma play a critical role in encouraging help-seeking.

Logistic Regression Analysis of Socio-Demographic Factors and Attitude Levels Associated with Utilization of Mental Health Services

Logistic regression analysis identified age, gender, and attitudes toward mental health services as significant predictors of service utilization among adolescents. Adolescents aged 21–23 years were approximately 3.8 times more likely to utilize services compared to those aged ≤20 years (AOR = 3.753; 95% CI: 1.861–7.570; p = 0.001), while those aged ≥24 years were 2.2 times more likely (AOR = 2.235; 95% CI: 1.239–4.032; p = 0.008). Female adolescents were 5.8 times more likely to access mental health services than males (AOR = 5.810; 95% CI: 3.249–10.389; p = 0.001). Duration of residence in Kicukiro District was not statistically significant in the adjusted model, with adolescents residing for less than one year showing lower odds of utilization compared to those residing for ≥7 years (AOR = 0.458; 95% CI: 0.220–0.953; p = 0.108).

Attitude toward mental health services was a particularly strong determinant of utilization.

Table 4: *Association of Socio-Demographic Characteristics, Knowledge, and Attitude with Mental Health Service Utilization Among Adolescents in Kicukiro District, Rwanda (N=384)*

Variable	Category	Yes	No	Chi-Square (χ^2)	p-value
Age	≤20 years	25	80	14.424	**0.001**
	21–23 years	64	120		
	≥24 years	47	48		
Gender	Male	24	124	38.813	**0.001**
	Female	112	124		
Education Level	Primary	10	17	0.346	0.841
	Secondary	39	65		
	Tertiary/College	87	166		
Occupation	Student	73	140	0.702	0.704
	Employed	45	82		
	Unemployed	18	26		
Residence in Kicukiro	Yes	132	239	0.127	0.722
	No	4	9		
Duration of Stay in Kicukiro	<1 year	24	25	9.348	**0.025**
	2–3 years	36	47		
	4–6 years	14	30		
	≥7 years	62	146		
Knowledge Levels	Low (14–18)	85	140	3.300	0.192
	Moderate (19–24)	8	28		
	High (25–28)	43	80		
Attitude Levels	Negative (5–8)	24	52	44.463	**0.001**
	Neutral (9–12)	59	170		
	Positive (13–16)	53	26		

**Chi-square (χ^2) test was used to examine the association between categorical independent variables and mental health service utilization. A p-value <0.05 was considered statistically significant.*

Table 6: *Logistic Regression Analysis of Socio-Demographic Factors and Attitude Levels Associated with Utilization of Mental Health Services Among Respondents in Kicukiro District (N=384)*

Variable	Category	Yes	No	P-value	AOR	95% C.I. for AOR (Lower)	95% C.I. for AOR (Upper)
Age	≤20 years	25	80	0.001	—	—	—
	21–23 years	64	120	—	3.753	1.861	7.570
	≥24 years	47	48	—	2.235	1.239	4.032
Gender	Female	112	124	0.001	5.810	3.249	10.389
	Male	24	124	—	—	—	—
Duration of Stay in Kicukiro	<1 year	24	25	0.108	0.458	0.220	0.953
	2–3 years	36	47	—	0.602	0.326	1.112
	4–6 years	14	30	—	1.001	0.456	2.200
	≥7 years	62	146	—	—	—	—
Attitude Levels	Negative (5–8)	24	52	0.001	6.393	2.968	13.768
	Neutral (9–12)	59	170	—	8.090	4.246	15.414
	Positive (13–16)	53	26	—	—	—	—
Constant	—	—	—	0.001	0.132	—	—

Reference categories — Age: ≤20 years; Gender: Male; Duration of stay in Kicukiro: ≥7 years; Attitude: Positive (score 13–16)

Adolescents with negative attitudes were 6.4 times more likely to use services than those with positive attitudes (AOR = 6.393; 95% CI: 2.968–13.768; p = 0.001), and those with neutral attitudes were 8.1 times more likely (AOR = 8.090; 95% CI: 4.246–15.414; p = 0.001). The statistically significant constant term (p = 0.001) indicates that the model fits the data well. Overall, these findings underscore that interventions aiming to improve adolescent mental health service uptake should focus on fostering positive attitudes, supporting younger adolescents, and addressing gender-specific barriers.

DISCUSSION

The findings of this study provide important insights into the utilization of mental health services among adolescents aged 18–24 years in Kicukiro District, Rwanda, and highlight several key patterns that align with broader evidence from low and middle income countries (LMICs). First, despite relatively high awareness of mental health services (83.6%), only 35.4% of adolescents reported ever utilizing such services. This underscores a persistent treatment gap that is documented widely in LMIC contexts, where formal mental health care utilization remains low even among those with significant need [17, 18].

The demographic profile showed that nearly half of participants were aged 21–23 years and that females comprised the majority of the sample. This is consistent with other LMIC studies demonstrating that older adolescents and females are more likely to use mental health services compared to younger individuals and males [17, 19]. For example, a recent analysis of national adolescent health surveys from Kenya, Indonesia, and Vietnam found significantly greater odds of service use among older adolescents and females [18]. Such patterns may reflect a combination of greater autonomy, increased perceived need, and differential help seeking norms among older youth [17].

However, the overall utilization remains low in comparison with the prevalence of mental health problems, suggesting substantial unmet need.

Global evidence indicates that adolescents in middle-income regions often seek informal help (family, peers, teachers) rather than professional services, with formal service use often below 2% in some middle-income countries [19, 20]. This substantial unmet need indicates that awareness alone does not ensure service uptake.

Consistent with other LMIC studies, internalizing problems such as depression, anxiety, and stress were the leading reasons for using mental health services. These findings resonate with other research indicating that internalizing symptoms drive help seeking when services are accessed, yet many adolescents with such conditions still do not receive formal care [18]. In the NAMHS analysis, emotional problems and behavioral issues were primary drivers of service engagement, but overall access remained limited [17], highlighting a similar pattern to the current findings.

Although the majority of adolescents were aware of available service types and access points (e.g., health centres, private clinics, and hospitals), knowledge was uneven, especially for digital or online platforms. Low mental health literacy has been identified as a key barrier to service utilization in LMIC settings, compounded by stigma and socio-cultural beliefs about mental health and its causes [20]. Studies in Africa and Asia emphasize that limited familiarity with formal services and where to find them contributes to low utilization [20, 21], suggesting that targeted public education is needed to bridge the gap between awareness and actionable knowledge.

Beyond knowledge, the association between attitudes toward mental health and service utilization was particularly strong in this study. Unexpectedly, adolescents with neutral or negative attitudes toward mental health were significantly more likely to utilize services than those with positive attitudes. Several explanations may account for this counterintuitive finding. Reverse causality is one plausible interpretation, given the cross-sectional design. Attitudes may have been shaped after service utilization rather than before it. Adolescents who accessed services may have encountered long waiting times, limited confidentiality, perceived stigma within care settings, or unmet expectations regarding symptom improvement, leading them to develop more critical or negative views of mental health care. In this case, service exposure may have influenced attitudes rather than attitudes determining help-seeking behavior.

Additionally, adolescents experiencing more severe psychological distress may seek care despite holding negative or ambivalent attitudes, as symptom burden may override attitudinal barriers. This suggests that a higher need for care could coexist with unfavorable perceptions of services. The finding may also reflect measurement complexity, whereby adolescents without prior exposure to services report socially desirable or idealized positive attitudes, while those with lived experience express more nuanced or critical perspectives. Nevertheless, attitudinal barriers, including stigma, fear of judgment, and misconceptions, remain well documented in LMICs as significant impediments to adolescent help-seeking [20]. Evidence from African settings highlights stigma, preference for traditional treatments, and limited mental health literacy as key obstacles [22], and qualitative research in Rwanda underscores sociocultural constraints, financial limitations, and fear of stigmatization as barriers to mental health service utilization [23]. Taken together, these findings underscore the need for longitudinal and qualitative research to clarify the temporal relationship between attitudes and service utilization and to better understand adolescents' lived experiences within mental health systems in Rwanda.

Structural challenges also play an important role. Limited availability of trained mental health professionals, scarcity of services, and lack of adolescent-friendly care pathways are widely reported in LMICs, and these systemic issues reinforce low utilization despite significant need [17, 23]. Integration of mental health care into primary health services, task sharing with non-specialists, and expansion of community-based supports have been proposed as ways to address these gaps [24].

The low overall utilization observed in this study reflects broader patterns in LMICs: for example, nationally representative data from Kenya, Indonesia, and Vietnam show that less than one in ten adolescents with a mental disorder accessed care in the previous year [18]. Similarly, research across West Africa documents pervasive shortfalls in adolescent mental health services availability and utilization, with some districts reporting service provision rates as low as 9%–42% of expected need [20]. These comparisons illustrate that the barriers and patterns identified in Kicukiro District are not unique but part of a systemic issue in LMICs.

The results emphasize the need for multi level interventions to improve adolescent mental health service utilization. Strategies that combine mental health education, community stigma reduction, school based screening, and integration of services into primary health and community settings have shown promise in LMIC contexts [24]. For example, interventions that raise awareness, identify individuals in need, and actively promote help seeking can strengthen the mental health care pathway [24]. Furthermore, digital tools, though currently under recognized by adolescents in this study, represent potential avenues for improving accessibility if accompanied by efforts to increase digital literacy and culturally relevant content.

This study is strengthened by its focus on an urban LMIC population and its comprehensive examination of socio-demographic, attitudinal, and awareness factors influencing adolescent mental health service utilization. However, several limitations should be acknowledged. First, the cross-sectional design limits the ability to draw causal inferences, as exposure and outcome variables were measured simultaneously. Second, the use of self-reported measures introduces the potential for social desirability and recall bias, which may affect the accuracy of responses regarding service use and attitudes. Third, the recruitment of participants primarily from schools, youth centers, and community settings may have introduced selection bias, potentially excluding out-of-school youth who might have different help-seeking behaviors. Finally, the findings are specific to Kicukiro District, and caution should be exercised in generalizing results to adolescents in other districts or rural areas.

Interestingly, knowledge of mental health services was not a significant predictor of utilization in this study. This suggests that awareness alone may be insufficient to drive service use, highlighting the importance of attitudinal factors, perceived stigma, and personal experiences in determining help-seeking behavior. Adolescents may be aware of available services but still refrain from accessing them due to negative perceptions, fear of judgment, or other social and psychological barriers. These findings underscore the need for interventions that not only increase knowledge but also target attitude change, stigma reduction, and supportive environments to enhance mental health service uptake among adolescents.

CONCLUSION

This study demonstrates that, despite relatively high awareness of mental health services among adolescents in Kicukiro District, the actual use of these services remains markedly limited. The findings indicate that awareness alone is insufficient to translate into help-seeking behavior, as service utilization appears to be more strongly influenced by demographic factors and attitudes toward mental health care. Adolescents experiencing internalizing psychological challenges, such as emotional distress and interpersonal difficulties, were the primary users of available services.

Importantly, attitudes toward mental health emerged as a key driver of service utilization, suggesting that stigma, perceptions of mental health care, and personal beliefs may play a greater role in determining help-seeking behavior than knowledge alone. These results highlight the need to move beyond awareness campaigns and focus on interventions that foster positive attitudes, normalize help-seeking, and address sociocultural barriers to accessing care.

Strengthening adolescent mental health services in Rwanda therefore requires comprehensive, youth-centered strategies that improve accessibility and acceptability of care. Expanding community- and school-based mental health support, integrating services within primary health care systems, and utilizing digital platforms may help reach adolescents more effectively. Promoting mental health literacy while simultaneously addressing stigma and attitudinal barriers will be essential to ensuring that adolescents are able to access timely and appropriate mental health support.

Authors' contributions
MAG: Conceptualization, study design, supervision, and manuscript review. JR&LBB: Data collection, data analysis, and drafting of the results section. YG: Literature review, methodology development, and writing of the introduction and discussion sections.

All authors read and approved the final manuscript.

REFERENCES

[1] World Health Organization, World Mental Health Report: Transforming Mental Health for All, Geneva, Switzerland: WHO, 2022. [Online]. Available: https://www.who.int/publications/i/item/9789240049338

[2] R. C. Kessler, P. Berglund, O. Demler, R. Jin, K. R. Merikangas, and E. E. Walters, "Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication," Arch. Gen. Psychiatry, vol. 62, no. 6, pp. 593–602, 2005. doi: 10.1001/archpsyc.62.6.593

[3] African Union, Continental Mental Health Strategy for Africa 2022–2032, Addis Ababa, Ethiopia: AU, 2022.

[4] M. Petagna, C. Marley, C. Guerra, C. Calia, and C. Reid, "Mental Health Gap Action Programme intervention Guide (mhGAP-IG) for Child and Adolescent Mental Health in Low- and Middle-Income Countries (LMIC): A Systematic Review," Community Ment. Health J., vol. 59, no. 1, pp. 192–204, 2023. doi: 10.1007/s10597-022-00981-3

[5] C. Henderson, S. Evans-Lacko, and G. Thornicroft, "Mental illness stigma, help seeking, and public health programs," Am. J. Public Health, vol. 103, no. 5, pp. 777–780, 2013. doi: 10.2105/AJPH.2012.301056

[6] Kenya Ministry of Health, National Adolescent Mental Health Survey, Nairobi, Kenya: MoH, 2021. [Online]. Available: https://aphrc.org/wp-content/uploads/2022/10/K-NAMHS-report_2022.pdf

[7] L. Kyohangirwe, E. Okello, J. D. Namuli, G. Ndeezi, and E. Kinyanda, "Prevalence and factors associated with major depressive disorder among adolescents attending a primary care facility in Kampala, Uganda," Trop. Doct., vol. 50, no. 1, pp. 30–36, 2020. doi: 10.1177/0049475519879586

[8] A. Umubyeyi, I. Mogren, J. Ntaganira, and G. Krantz, "Help-seeking behaviours, barriers to care and self-efficacy for seeking mental health care: a population-based study in Rwanda," Soc. Psychiatry Psychiatr. Epidemiol., vol. 51, no. 1, pp. 81–92, 2016. doi: 10.1007/s00127-015-1130-2

[9] Rwanda Ministry of Health, Rwanda Mental Health Strategic Plan 2020–2024, Kigali, Rwanda: MoH, 2020. [Online]. Available: https://www.rbc.gov.rw/fileadmin/user_upload/mental/National-Mental-health-Policy.pdf

[10] Rwanda Biomedical Centre, Mental Health Survey Report, Kigali, Rwanda: RBC, 2018.

[11] S. L. Smith et al., "Evaluating process and clinical outcomes of a primary care mental health integration project in rural Rwanda: a prospective mixed-methods protocol," BMJ Open, vol. 7, no. 2, p. e014067, 2017. doi: 10.1136/bmjopen-2016-014067

[12] J. O. Lee et al., "Unemployment and substance use problems among young adults: Does childhood low socioeconomic status exacerbate the effect?," Soc. Sci. Med., vol. 143, pp. 36–44, 2015. doi: 10.1016/j.socscimed.2015.08.016

[13] Ministry of Health Rwanda, Baho Neza Project Evaluation Report, Kigali, Rwanda: MoH, 2022. [Online]. Available: https://www.migeprof.gov.rw/news-detail/government-launches-baho-neza-integrated-campaign-to-promote-healthy-and-happy-families-1

[14] K. Salaheddin and B. Mason, "Identifying barriers to mental health help-seeking among young adults in the UK: a cross-sectional survey," Br. J. Gen. Pract., vol. 66, no. 651, pp. e686–e692, 2016. doi: 10.3399/bjgp16X687313

[15] K. MacDonald, N. Fainman-Adelman, K. K. Anderson, and S. N. Iyer, "Pathways to mental health services for young people: a systematic review," Soc. Psychiatry Psychiatr. Epidemiol., vol. 53, no. 10, pp. 1005–1038, 2018. doi: 10.1007/s00127-018-1578-y

[16] UNICEF Rwanda, Adolescent Mental Health and Well-being Report, Kigali, Rwanda: UNICEF, 2023. [Online]. Available: https://www.unicef.org/esa/media/16501/file/UNICEF-Rwanda-Case-Study-Child-Adolescent-Mental-Health-2025.pdf

[17] A. E. Wahdi et al., "Mental health service use among adolescents in three low- and middle-income countries: An analysis of the National Adolescent Mental Health Surveys," Child Adolesc. Psychiatry Ment. Health, vol. 19, Suppl. 1, p. 84, 2025. doi: 10.1186/s13034-025-00924-2

[18] P. Viksveen, N. E. Cardenas, S. H. Berg, A. Salamonsen, J. R. Game, and S. Bjønness, "Adolescents' involvement in mental health treatment and service design: a systematic review," BMC Health Serv. Res., vol. 24, no. 1, p. 1502, 2024. doi: 10.1186/s12913-024-11892-2

[19] E. Eustache et al., "High burden of mental illness and low utilization of care among school-going youth in Central Haiti: A window into the youth mental health treatment gap in a low-income country," Int. J. Soc. Psychiatry, vol. 63, no. 3, pp.

261–274, 2017. doi: 10.1177/0020764017700174

[20] S. Saade, A. Parent-Lamarche, T. Khalaf, S. Makke, and A. Legg, "Correction: What barriers could impede access to mental health services for children and adolescents in Africa? A scoping review," BMC Health Serv. Res., vol. 24, no. 1, p. 559, 2024. doi: 10.1186/s12913-024-11046-4

[21] A. Yenet, G. Nibret, and B. A. Tegegne, "Challenges to the Availability and Affordability of Essential Medicines in African Countries: A Scoping Review," Clinicoecon. Outcomes Res., vol. 15, pp. 443–458, 2023. doi: 10.2147/CEOR.S413546

[22] G. Endrawes and O. Ogunsiji, "Exploring African Community Attitudes Towards Mental Illness in Australia: A Cross-Sectional Study," Healthcare (Basel), vol. 13, no. 23, p. 3115, 2025. doi: 10.3390/healthcare13233115

[23] World Health Organization, "Mental health of adolescents," 2025. [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

[24] Z. Mubeen, Z. Fatmi, W. Hameed, and M. Asim, "Barriers and facilitators to accessing adolescents' mental health services in Karachi: users and providers perspectives," BMC Health Serv. Res., vol. 24, no. 1, p. 157, 2024. doi: 10.1186/s12913-024-10593-0

Original Research **Open Access**

Healthcare Utilization and Equity under Universal Health Coverage in Rwanda: A Secondary Analysis of National Health System Data (2015–2023)

Musinga Abdulswamad[1,*]

[1]*James Lind Institute, Geneva, Switzerland*

***Corresponding author:**
Musinga Abdulswamad

James Lind Institute, Geneva, Switzerland

Email: musingaabdulswamad@gmail.com

Received: February 8, 2026
Accepted: March 29, 2026
Published: March 31, 2026

Cite this article as: Musinga. Healthcare Utilization and Equity under Universal Health Coverage in Rwanda: A Secondary Analysis of National Health System Data (2015–2023). *Rw. Public Health Bul. 2026. 7 (1): 20-24. https://dx.doi.org/10.4314/rphb.v7i1.3*

ABSTRACT

INTRODUCTION: Universal Health Coverage (UHC) aims to ensure equitable access to essential health services without financial hardship. Rwanda has made substantial progress toward UHC through its Community-Based Health Insurance (CBHI) scheme. This study assesses trends in healthcare utilization and equity in access using national-level secondary data.

METHODS: A secondary data analysis was conducted using Rwanda Demographic and Health Survey (2015, 2020), Ministry of Health annual reports (2015–2023), and World Health Organization UHC service coverage indicators. Descriptive and comparative analyses were applied to evaluate trends in outpatient visits, skilled birth attendance, and immunization coverage across socioeconomic and geographic groups. Evidence from peer-reviewed literature was integrated to contextualize findings.

RESULTS: Outpatient visits per capita increased from 1.5 in 2015 to 2.3 in 2023 (53% increase). Skilled birth attendance rose from 91% to 94% between 2015 and 2020, while immunization coverage remained above 90%. Despite these gains, disparities persisted across wealth quintiles and rural–urban populations. Key barriers included medicine stock-outs, co-payment requirements, transport challenges, and long waiting times, disproportionately affecting low-income groups.

CONCLUSION: Rwanda's UHC strategy has significantly improved healthcare utilization and service coverage. However, persistent inequities highlight gaps in financial protection and access. Strengthening supply chains, reducing indirect costs, and improving health literacy are essential to achieving equitable and sustainable UHC outcomes.

INTRODUCTION

Universal Health Coverage (UHC), articulated under Sustainable Development Goal 3.8, aims to ensure that all individuals have access to essential health services without experiencing financial hardship [1,2]. Achieving UHC depends on strong governance, equitable health financing, and effective service delivery systems, which remain challenging in many low- and middle-income countries (LMICs) [1]. In Sub-Saharan Africa, disparities in healthcare access and utilization persist despite global progress, particularly affecting vulnerable populations [,4].

Community-based health insurance (CBHI) has been widely adopted as a strategy to improve access to healthcare among rural and informal populations in LMICs [5]. However, experiences

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

from countries such as Ghana, Ethiopia, and Kenya show that CBHI schemes often face challenges including high out-of-pocket expenditures, inequities in access, and variability in service quality [5]. These limitations highlight the importance of examining contexts where CBHI has been implemented more successfully.

Rwanda represents one of the most cited examples of progress toward UHC in Sub-Saharan Africa [4,6,7]. Its UHC model is centered on the Community-Based Health Insurance system, locally known as Mutuelle de Santé, which is supported by strong political commitment and integrated into national development strategies such as Vision 2020 and Vision 2050 [6]. The use of the Ubudehe socioeconomic classification to determine insurance premiums has enabled targeting and expanded financial protection across population groups. As a result, CBHI enrollment exceeded 90% of the population by 2023, demonstrating substantial progress toward universal coverage [6]

Evidence indicates that Rwanda has achieved improvements in healthcare utilization, particularly in maternal and child health services [8] However, increased insurance coverage does not necessarily translate into equitable service utilization across all population groups [7]. Studies have shown that lower-income households and rural populations continue to experience barriers related to affordability, geographic access, and service availability [7,9]. Furthermore, disparities persist in awareness of insurance benefits and satisfaction with healthcare services, even among insured individuals [9].

Although previous studies have examined aspects of Rwanda's UHC implementation, many have focused on specific outcomes or short timeframes, limiting their ability to capture long-term trends in healthcare utilization and equity [7,9]. There remains a need for comprehensive analyses that integrate multiple national datasets with evidence from the literature to better understand how healthcare utilization has evolved under the CBHI system.

This study addresses this gap by conducting a secondary data analysis of healthcare utilization trends in Rwanda from 2015 to 2023. Using data from the Rwanda Demographic and Health Surveys, Ministry of Health reports, World Health Organization (WHO) indicators, and published literature, the study aims to assess patterns of service use and evaluate equity in access across socioeconomic and geographic groups. In addition, it seeks to identify persistent barriers to healthcare utilization and generate evidence to inform policy strategies for strengthening equitable access within Rwanda's UHC framework.

METHODS

Study Design

This study employed a retrospective secondary data analysis to evaluate trends in healthcare utilization under Rwanda's Universal Health Coverage (UHC) framework between 2015 and 2023. By integrating multiple nationally representative datasets with evidence from published literature, the study aimed to provide a comprehensive assessment of service utilization patterns and equity in access across different population groups.

Data Sources

Data were obtained from multiple complementary sources to ensure a robust and triangulated analysis. The primary quantitative data were derived from the Rwanda Demographic and Health Surveys (DHS) conducted in 2015 and 2020, which provide nationally representative estimates of healthcare utilization and population characteristics [8]. These were supplemented with longitudinal data from the Rwanda Ministry of Health Annual Health Statistics Reports (2015–2023), which capture trends in service utilization, health facility performance, and insurance coverage over time [10,11,12].

In addition, the World Health Organization (WHO) UHC Service Coverage Index [9] was used to provide standardized indicators for benchmarking health system performance. To contextualize quantitative findings and identify persistent barriers to healthcare access, relevant peer-reviewed literature on Rwanda's Community-Based Health Insurance (CBHI) system and health service utilization [7,9] was also reviewed.

Variables and Outcomes

The analysis focused on key indicators of healthcare utilization and service coverage. Primary outcome variables included outpatient visits per capita, skilled birth attendance, and immunization coverage, which collectively reflect access to essential health services and performance of the primary healthcare system.

Equity in healthcare utilization was assessed across multiple dimensions, including socioeconomic status (as defined by Ubudehe wealth categories), place of residence (rural versus urban), and broader socio-demographic characteristics. These variables were selected to capture disparities in access and utilization within the UHC framework.

Data Analysis

Descriptive statistical methods were used to summarize trends in healthcare utilization over the study period. Comparative analyses were conducted to examine differences across socioeconomic and geographic groups, with particular attention to identifying inequities in service use. Trends observed in national datasets were interpreted alongside findings from the literature to provide contextual explanations and to identify structural, financial, and geographic barriers influencing healthcare utilization.

Ethical Considerations

This study utilized publicly available, de-identified secondary and since I analysed anonymized data, no ethical approval was required. No human participants were also directly involved, and no identifiable personal data were accessed.

RESULTS

Healthcare utilization in Rwanda increased steadily between 2015 and 2023. Outpatient visits per capita rose from 1.5 to 2.3, representing a 53% increase. Skilled birth attendance improved from 91% in 2015 to 94% in 2020, while immunization coverage remained consistently above 90%, indicating strong performance in essential health services (Table 1).

Table 1: *Trends in Healthcare Utilization in Rwanda (2015-2023)*

Year	Mean Outpatient Visits Per Capita	Skilled Birth Attendance (%)
2015	1.5	91%
2017	1.8	92%
2019	2.0	93%
2021	2.2	93%
2023	2.3	94%

Despite these improvements, disparities in utilization persisted. Higher utilization rates were observed among wealthier households compared to lower-income groups, and urban populations accessed services more frequently than rural populations. These findings suggest that socioeconomic status and geographic location continue to influence healthcare access.

Multiple barriers to utilization were identified. Medicine stock-outs were frequently reported, particularly in rural facilities, leading to increased out-of-pocket expenditures. Long waiting times and workforce constraints limited timely access to care.

Financial barriers, including co-payments and indirect costs such as transportation, disproportionately affected low-income households. Geographic challenges, including long travel distances and poor infrastructure, further constrained access in rural areas.

DISCUSSION

This study demonstrates that Rwanda's UHC strategy has led to substantial improvements in healthcare utilization over the past decade. The observed increase in outpatient visits and sustained high coverage of maternal and child health services reflects the effectiveness of the CBHI model and broader health system reforms. These findings are consistent with previous studies highlighting Rwanda's success in expanding access to essential services through pro-poor financing and strong governance [6,13].

However, the persistence of disparities in utilization underscores a critical limitation of UHC implementation: insurance coverage alone does not guarantee equitable access. Socioeconomic and geographic inequalities continue to shape healthcare-seeking behavior, as also reported in other Sub-Saharan African contexts [14,15] [16]. This highlights the need to move beyond coverage metrics toward a more comprehensive focus on effective access and equity.

The study identifies three major categories of barriers: structural, financial, and informational. Structural barriers include medicine stock-outs and workforce shortages, which compromise service availability and quality. Financial barriers persist despite insurance coverage, as co-payments and indirect costs remain prohibitive for low-income households. Informational barriers, particularly limited awareness of CBHI benefits, reduce utilization even among insured populations [16,17].

From a policy perspective, these findings suggest that strengthening supply chain systems, investing in health workforce capacity, and improving infrastructure are essential to sustain gains in utilization. In addition, targeted subsidies and reforms to reduce co-payment burdens could enhance financial protection for vulnerable populations. Expanding community-based education and health literacy initiatives is also critical to improving awareness and utilization of available services.

This study has several strengths, including the use of multiple national datasets and a long-term analytical timeframe. However, limitations include reliance on secondary data, potential inconsistencies in reporting across sources, and inability to establish causal relationships.

CONCLUSION

Rwanda's UHC strategy has achieved significant improvements in healthcare utilization and service coverage between 2015 and 2023. However, persistent inequities in access highlight the need for targeted interventions addressing structural, financial, and informational barriers. Strengthening health system capacity, reducing indirect costs, and enhancing health literacy are critical to ensuring that UHC translates into equitable and effective access for all population groups. These recommendations are necessary: (1) strengthening supply chain systems and health workforce capacity to reduce medicine stock-outs and long waiting times, particularly in rural health facilities; (2) reforming financial protection mechanisms by reducing co-payment burdens and subsidizing indirect costs (e.g., transport) for low-income households to improve equitable access; and (3) enhancing community health literacy and benefit awareness through targeted communication strategies to improve understanding and utilization of CBHI services among vulnerable populations.

Availability of Data and Materials

The datasets analyzed during the current study are publicly available from the Rwanda Ministry of Health, WHO Global Health Observatory, and the Demographic and Health Surveys program. All sources cited in the references section provide access to the data used in this analysis.

REFERENCES

[1] M. P. Kieny et al., "Strengthening health systems for universal health coverage and sustainable development," Bull. World Health Organ., vol. 95, no. 7, pp. 537–539, Jul. 2017, doi: 10.2471/BLT.16.187476.

[2] D. D. Kipo-Sunyehzi, "Sustainable Development Goal 3.8 Universal Health Coverage from global perspectives: An analysis of the health insurance policies in Rwanda, Tanzania, South Africa, and Ghana," Health Sci. Investig. J., no. Volume 6 issue 1, pp. 814–822, Jul. 2024, doi: 10.46829/hsijournal.2024.7.6.1.814-822.

[3] M. Kyei-Nimakoh, M. Carolan-Olah, and T. V. McCann, "Access barriers to obstetric care at health facilities in sub-Saharan Africa—a systematic review," Syst. Rev., vol. 6, no. 1, p. 110, Dec. 2017, doi: 10.1186/s13643-017-0503-x.

[4] M. Nyandekwe, M. Nzayirambaho, and J. B. Kakoma, "Universal health coverage in Rwanda: dream or reality," Pan Afr. Med. J., vol. 17, 2014, doi: 10.11604/pamj.2014.17.232.3471.

[5] M. Nyandekwe, M. Nzayirambaho, and J. B. Kakoma, "Universal health insurance in Rwanda: major challenges and solutions for financial sustainability case study of Rwanda community-based health insurance part I," Pan Afr. Med. J., vol. 37, 2020, doi: 10.11604/pamj.2020.37.55.20376.

[6] R. Muremyi et al., "Barriers to health insurance uptake in Rwanda: a nationwide cross-sectional survey," Pan Afr. Med. J., vol. 51, 2025, doi: 10.11604/pamj.2025.51.8.45920.

[7] K. Liu, B. Cook, and C. Lu, "Health inequality and community-based health insurance: a case study of rural Rwanda with repeated cross-sectional data," Int. J. Public Health, vol. 64, no. 1, pp. 7–14, Jan. 2019, doi: 10.1007/s00038-018-1115-5.

[8] NISR, "The 2019-20 Rwanda Demographic and Health Survey (RDHS)," 2020.

[9] E. C. Langat, P. Ward, H. Gesesew, and L. Mwanri, "Challenges and Opportunities of Universal Health Coverage in Africa: A Scoping Review," Int. J. Environ. Res. Public. Health, vol. 22, no. 1, p. 86, Jan. 2025, doi: 10.3390/ijerph22010086.

[10] Rwanda Ministry of Health, "Annual Health Statistics Report 2020," Kigali, Rwanda, 2021. https://www.moh.gov.rw/health-reports

[11] Rwanda Ministry of Health, "Annual Health Statistics Report 2015," Kigali, Rwanda, 2016.

https://www.moh.gov.rw/health-reports

[12] Rwanda Ministry of Health, “Annual Health Statistics Report 2024,” Kigali, Rwanda. https://www.moh.gov.rw/health-reports

[13] M. Abdulswamad, “Does Universal Health Coverage Improve Access to Healthcare? Insights from Rwanda’s National Health System,” Nov. 03, 2025, In Review. doi: 10.21203/rs.3.rs-7978334/v1.

[14] T. S. Alamneh et al., “Socioeconomic inequality in barriers for accessing health care among married reproductive aged women in sub-Saharan African countries: a decomposition analysis,” BMC Womens Health, vol. 22, no. 1, p. 130, Apr. 2022, doi: 10.1186/s12905-022-01716-y.

[15] G. I. Oke and O. Sibomana, “Understanding Health Inequality, Disparity and Inequity in Africa: A Rapid Review of Concepts, Root Causes, and Strategic Solutions,” Public Health Chall., vol. 4, no. 1, p. e70040, Mar. 2025, doi: 10.1002/puh2.70040.

[16] O. A. Farih et al., “Financial barriers and inequalities in healthcare access across East Africa: evidence from demographic and health surveys,” Front. Reprod. Health, vol. 7, p. 1730560, Jan. 2026, doi: 10.3389/frph.2025.1730560.

[17] D. Osei Afriyie, K. A. Damoah, E. C. Mussa, F. Otchere, and N. Tirivayi, “Barriers and facilitators to health services utilization among households with free community-based health insurance enrolment in Ethiopia: A qualitative study,” SSM - Health Syst., vol. 4, p. 100066, Jun. 2025, doi: 10.1016/j.ssmhs.2025.100066.

Original Research **Open Access**

Experiences of Parents of Children with Physical Disability on Physical Rehabilitation Services at the University Teaching Hospital of Butare (CHUB): A qualitative Study, 2024

Peter Mooni Nyangezi[1,*], Joseph Nshimiyimana[1], Divine Girizina[1], Jean Marie Vianney Iradukunda[1], Philemon Iradukunda[2], Ruth Umutoni[3], Celestin Bigirimana[4]

[1] *Department of Occupational Therapy, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali-Rwanda*
[2] *Department of Medical Imaging Sciences, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali-Rwanda*
[3] *Department of Occupational Therapy, Rwanda Military Referral and Teaching Hospital, Kigali, Rwanda*
[4] *Department of Occupational Therapy, University Teaching Hospital of Kigali, Kigali, Rwanda*

ABSTRACT

INTRODUCTION: Access to rehabilitation services is essential for improving functional outcomes and quality of life among children with physical disabilities. In Rwanda, however, families often face multiple barriers when seeking these services, and evidence on caregiver experiences remains limited. This study aimed to explore the lived experiences of parents of children with physical disabilities regarding access to and utilization of rehabilitation services at the University Teaching Hospital of Butare (CHUB).
METHODS: A qualitative phenomenological design was employed. Ten mothers of children with physical disabilities who had attended rehabilitation services for at least five months were purposively selected. Data were collected through in-depth, semi-structured interviews conducted in Kinyarwanda and later translated into English. Audio-recorded interviews were transcribed verbatim and analyzed using Braun and Clarke's six-phase thematic analysis approach.
RESULTS: Three main themes emerged: barriers to accessing rehabilitation services, rehabilitation outcomes, and parental adaptability and experienced burden of disability. Key barriers included high transportation and treatment costs, long distances to services, limited awareness, health system constraints, and social stigma. Despite these challenges, parents reported improvements in their children's physical and emotional functioning following rehabilitation. Caregivers also demonstrated resilience, drawing support from peer interactions and gradually adapting to their caregiving roles. However, significant economic strain, caregiving stress, and disruptions to family life were consistently reported.
CONCLUSION: Parents of children with physical disabilities in Rwanda face substantial financial, structural, and social barriers to accessing rehabilitation services. Strengthening decentralized services, improving community awareness, and enhancing financial protection mechanisms are critical to improving equitable access and outcomes.

***Corresponding author:**
Peter Mooni NYANGEZI

Department of Occupational Therapy, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali-Rwanda

Email: moonipeter500@gmail.com

Received: February 6, 2026
Accepted: March 25, 2026
Published: March 31, 2026

Cite this article as: Nyangezi et al. Experiences of Parents of Children with Physical Disability on Physical Rehabilitation Services at the University Teaching Hospital of Butare (CHUB): A qualitative Study, 2024. *Rw. Public Health Bul. 2026. 7 (1): 25-34. https://dx.doi.org/10.4314/rphb.v7i1.2*

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

INTRODUCTION

Disability is a profound global public health issue that touches nearly every community worldwide. More than one billion people, approximately one in seven of the global population, live with a disability [1]. This challenge is particularly acute in developing countries, where 80% of people with disabilities reside [1,2]. As the global population ages, this prevalence is projected to intensify, with the number of affected individuals expected to reach two billion by 2050 [2].

The prevalence of disability among children presents a significant concern, especially in Africa and other developing regions. Globally, UNICEF estimated that 236.4 million children aged 0–17 years have moderate-to-severe disabilities [3]. In Africa, disability prevalence is estimated at 10% of the population, a figure that doubles to 20% in impoverished regions [4]. Among children, cerebral palsy (CP) is a major cause of physical disability, with an estimated prevalence of 2 to 2.5 per 1,000 live births across Africa [5]. Despite this, national data on childhood disability in Rwanda remains scarce [6]. While national surveys estimated the overall disability rate at 5% of the population [7,8] the government has initiated programs to address this issue [9], but the capacity for care is severely constrained.

Physical rehabilitation is crucial for promoting functional development and a successful transition to adulthood [10]. However, access to these services is limited, particularly in resource-poor settings. Key barriers include a shortage of trained professionals, with the availability of occupational and physical therapists falling significantly below recommended standards [11]. This functional gap places an immense strain on the healthcare system and has severe consequences for families [12]. The burden of disability on families is often catastrophic, resulting in financial hardship, job alterations, and psychological stress for caregivers, especially mothers [13]. Families seeking care also face substantial barriers, including a lack of knowledge about available services [14], high costs, and long distances to facilities [15]. Despite increasing recognition of the importance of rehabilitation services for children with physical disabilities in Rwanda, there is limited evidence on the lived experiences of parents and caregivers navigating these services. Understanding these experiences is essential for improving service delivery and addressing barriers to care. In Rwanda, there is a critical lack of evidence on pediatric rehabilitation services and their local impact, leading to limited knowledge on people's perceptions of the rehabilitation services they receive [16]. Thus, this study aims to examine parents' perceived knowledge of rehabilitation services for children with physical disabilities in Rwanda.

METHODS

Study design

This study utilized a qualitative phenomenological design to explore the experiences of parents of children with physical disabilities on physical rehabilitation services being received at CHUB.

Study Setting

This study was conducted at the University Teaching Hospital of Butare (CHUB), situated in the southern province of Rwanda, specifically in the Huye district and Ngoma sector. This teaching hospital provides physical rehabilitation services to the surrounding region and referral population. The number of people living nearby who need rehabilitation services, and those living in its coverage area, are referred to this hospital for rehabilitation and other specialty services, as it is a teaching hospital where experts specialize and teach university students.

Study population

Participants included parents and caregivers (all female, mothers) of children with physical disabilities who attended the physical rehabilitation at CHUB. A child whose parents were included in this study had to be at least not old than 12 years of age and attend rehabilitation services for a minimum of 5 months for the parents to be included in the study.

This was to ensure that participants had sufficient experience with the rehabilitation services and could provide accurate and detailed information about the impact of these services on their child's physical disability.

The study excluded individuals/participants whose children had other types of disabilities, such as multiple disabilities, and parents/caregivers of children who had not attended services for at least 5 months to rule out potential bias in data collection that could influence the findings.

Sampling strategy and sample size

A non-probability purposive sampling technique [17] was used. Participants were purposively selected, mothers of children with physical disabilities attending rehabilitation services for at least five months. A total of 10 participants were recruited. Recruitment continued until thematic saturation was achieved. There was no existing themes or subthemes or existing insights whose related questions could affect participants in answering the study question.

Data collection methods

In-depth semi-structured interviews were conducted using a designed interview guide. This guide was developed by the study team in alignment with the study's objectives, informed by a thorough review of relevant literature and the researchers' expertise in physical rehabilitation. Its primary purpose was to explore participants' perceptions and lived experiences regarding the physical rehabilitation services provided to their children with physical disabilities.

To ensure trustworthiness, the interview guide was piloted with three individuals who were not part of the main study. This pilot phase demonstrated that the guide was efficient in eliciting the intended information and allowed for minor adjustments to enhance its relevance and flow.

Data collection procedures

Following approval of the study by the University of Rwanda Institutional Review Board and the University Teaching Hospital of Butare (CHUB), the researcher contacted the Head of the Department of Functional Rehabilitation and Workshop. This departmental leader played a key role in facilitating access to eligible study participants.

All interviews were conducted by the principal investigator, a trained healthcare professional with prior experience in qualitative interviewing. Data were collected using semi structured interviews conducted in a private consultation room. Interviews lasted 45–60 minutes, were conducted in Kinyarwanda, and audio recorded with participant consent. Field notes were taken to capture non-verbal cues and contextual observations.

Data Analysis

Audio recordings were transcribed verbatim and translated into English by the principal investigator, who is fluent in both languages. Themes were derived inductively from participant narratives. To ensure accuracy, the transcripts were carefully compared with the original audio files. To ensure accuracy, translated transcripts were cross-checked against original recordings.

Data were managed using ATLAS.ti version 24 (Scientific Software Development GmbH version 24) to facilitate systematic data analysis.

The data were analyzed using the principles of thematic analysis, following Braun and Clarke's six phase approach [18], whereby themes emerged directly from the data rather than being predetermined:

Familiarization: Members of the study team thoroughly read and re-read the transcripts to immerse themselves in the data.

Initial coding: The team generated preliminary codes to capture key features of the data.

Searching for themes: Codes were organized into potential themes based on patterns and relationships.

Reviewing themes: Themes were refined and validated against the dataset to ensure coherence and relevance.

Defining and naming themes: Clear definitions and labels were assigned to each theme and subtheme.

Reporting: The final themes were used to structure the findings and facilitate meaningful interpretation.

Trustworthiness of the study

To ensure data reliability, trustworthiness was established through credibility, confirmability, transferability, and dependability. Credibility was strengthened by supporting themes with verbatim participant quotations and conducting peer discussions with qualitative research experts. Confirmability was enhanced by maintaining objectivity during data analysis. Transferability was supported through detailed descriptions of the study setting, participant selection, data collection, and analysis procedures. Dependability was ensured through a systematic code-recode procedure to maintain consistency during analysis.

Ethical Considerations

Ethical approval was obtained from the University of Rwanda College of Medicine and Health Sciences Institutional Review Board (Ref: CMHS/IRB/517/2023). Permission to conduct the study was granted by the University Teaching Hospital of Butare, CHUB management (Ref: CHUB/DG/NC/12/2858/2023), with approval notice (No: REC/UTHB/103/2023). Written informed consent was obtained from all participants; for those unable to read, information was read aloud, and consent was confirmed by signature. Participation was voluntary, and participants could withdraw their consent at any time; confidentiality was maintained throughout the study.

RESULTS

Participant's Demographics and Socio-economic profile

The study included 10 participants, all of whom were mothers and primary caregivers of children with physical disabilities. No male caregivers were included in the final sample. Their ages ranged from 25 to 43. Participants were formally employed but also engaged in small household businesses, farming, or other agricultural activities to earn a living.

Although the inclusion criteria allowed children up to 12 years old, all children in the study were younger than 5 years old. This limited age representation may restrict the transferability of findings, as parents of older children may experience different rehabilitation challenges, including schooling, long-term care planning, and social integration.

The 10 children with physical disabilities ranged in age from 1 year and 3 months to 4 years old. The diagnoses included Cerebral palsy (n=6), Down syndrome (n=3), and Erb's palsy (n=1).

All participants reported having accessed general healthcare services for their children at health centers. Six children had attended rehabilitation centers before being referred to a University Teaching Hospital in Butare, while four began rehabilitation at a referral hospital via an internal transfer. Of all the children, only one was enrolled in preschool or kindergarten.

Themes and Sub-themes

Table 1 organizes the findings from the semi-structured interviews, highlighting the main themes and sub-themes that emerged from participants' experiences with physical rehabilitation services for their children with physical disabilities.

During in-depth semi-structured interviews, participants were asked about their perceptions and experiences of physical rehabilitation services for their children with physical disabilities. Three main themes emerged: barriers to accessing rehabilitation services, rehabilitation outcomes, and parental adaptability and experienced burden. These themes were further divided into related sub-themes. Theme 1: Barriers to Accessing Rehabilitation Services resulted in 4 sub-themes: cost of transportation and treatment, Structural and system-related barriers, limited knowledge of service availability, and social stigma. Theme 2: Rehabilitation outcomes, merged into three subthemes: improved physical and emotional abilities; acceptance, adaptability, and resilience; and Peer connection and support. Lastly, theme 3: Parental adaptability and experienced burden

Table 1: *Identified themes and subthemes from interviews conducted*

Themes	Sub-themes
Barriers to Accessing Rehabilitation Services	High cost of transportation and treatment
	Structural or system related barriers
	Limited knowledge of the availability of the services
	Social stigma
Rehabilitation Outcomes	Improved Physical and Emotional abilities
	Acceptance, Adaptation and Resilience
	Peer connection and Support
Parental adaptability and experienced burden of disability	Parenting stress and scheduling difficulties
	Economic burden and its Impact to Family Life

of disability, resulted in two subthemes, which include Parenting stress and scheduling difficulties, and Economic burden and family dynamics.

Barriers to Accessing Rehabilitation Services: This theme captures structural, financial constraints, transportation challenges, long waiting times, limited awareness, and social stigma as the major barriers.

1. High cost of transportation and treatment: Parents reported significant costs, including medical expenses and high transportation fares, which were often prohibitive.

"*It has greatly affected our family financially. We struggle to find money for twice-weekly appointments, and transport and service costs are exhausting our family economy. We have no choice because helping our child is a priority, and even his siblings are affected.*" (P10)

Financial strain was the most significant barrier. Parents reported prohibitive costs for treatment and high transportation fares due to long travel distances

"*The hospital is far, and we must walk long distances, which is very costly. The expenses are overwhelming and leave the family in poverty because the child requires constant assistance.*" (P02)

"Transport cost is a major barrier. Sometimes I postpone appointments because I cannot afford the fare, even though my child needs treatment." (P08)

2. Structural or system-related barriers: There are several reasons why some mothers or family's experiences difficulties to sending their children with disabilities (CWD) to rehabilitation centers or hospitals for treatment. Challenges included long waiting times due to limited staff and an inadequate referral system where primary health centers lacked knowledge about CWD conditions.

"At the health center, they did not understand my child's condition and were reluctant to refer us, which delayed access to proper care." (P01)

"We wait for many hours because there are few therapists, which disrupts my daily responsibilities." (P10)

In a remote village in Rwanda, nestled amidst the rolling hills, accessing even basic healthcare services at a distance can be challenging for residents. With no paved roads leading to the village and public transportation at best, a journey to the health facility or hospital can take hours on foot some mothers recount the struggle of carrying their children on their backs, navigating steep and rocky paths to the bus stop to take children to the hospital.

"Reaching the hospital is difficult due to long distances and lack of transport, making access to care very challenging." (P02)

3. Limited knowledge of the availability of the services: This was also reported as a barrier to accessing the rehabilitation services as the essential need for CWD due to lack of information on service availability as narrated by some of the participants.

"We did not know what rehabilitation was or how it could help our child, which delayed seeking care." (P09)

"I can't explain how rehabilitation helped us even our mental health was not good before we had no hope but now, we have testimonies. Many parents in the village do not believe rehabilitation works and do not bring their children for treatment because they lack information." (P07)

4. Social stigma: Societal judgments and negative attitudes towards disability from others were also reported as main challenges affecting access to care as the main contributing factors to the stigma affecting the families where social discrimination and gossiping false narrations about the families of children with disability led the parents to live hopeless life for the children limit their decision to seek service access.

"When you have a child with a disability, people gossip and say discouraging words to you and your family" P09

"When I started bringing my child, they used to tell my husband that we were wasting time and money, and the child wouldn't improve or get better but we didn't care because we believed our child could be healed here" P07

Participants reported experiencing stigma, discrimination, and negative community attitudes toward their children's disabilities. Mothers described being subjected to gossip, blame, and

harmful societal beliefs linking disability to moral wrongdoing or punishment. These experiences affected their emotional well-being and willingness to seek services. One participant explained:
"People spread negative rumors, blaming my child's disability on my behavior and calling it God's punishment, but I was not affected because I knew I was not guilty." (P06)

Rehabilitation outcomes

1. Improved Physical and Emotional abilities: Rehabilitation services have significantly improved the child's condition including physical and emotional well-being, and participants reported tangible, positive changes in their children, serving as a powerful motivator.
"My child has improved emotionally and physically. He can now stand, hold objects, and express happiness." (P09)
"My child is happier now. He interacts more, laughs, and shows improved physical movements." (P01)

2. Acceptance, Adaptation and Resilience: The rehabilitation services have positively impacted the well-being of both children as beneficiaries as well as their families especially their mothers as their everyday caregivers, majority of the parents/mothers of children with disabilities in the interview narrated personal improvement resulting from the service given to their children. The service experience facilitated personal growth, improving parents' commitment to care and acceptance of the child's condition.
"Seeing other children and sharing experiences with parents and therapists helped me accept my situation and realize I was not alone. Rehabilitation requires sacrifice, but I am committed because it helps my child improve" P05
"Sharing experiences with other parents gives me strength, hope, and emotional support. If my heart is down, I call one of the parents we talk and counsel each other and then life goes on" P10

3. Peer connection and Support: Despite a child's disability being a catastrophic and challenging factor to parents and families in general, parents of children with disabilities' connection and sharing stories and testimonies at the hospital waiting for the services has built a bridge of hope and resilience in their lives.
"Hearing testimonies and sharing experiences with other parents gave me strength, healed me emotionally, and helped us build confidence and hope. When I feel down, I talk to other parents and we support each other." (P10)
"Meeting other parents and sharing experiences helped me feel supported and build resilience." (P07)

Parental adaptability and Experienced Burden of disability

Parenting stress and scheduling difficulties: The study revealed that these parents experience elevated levels of stress because of the intricacies involved in caring for a child with special needs. Complex appointment schedules frequently forced parents to neglect other essential obligations, elevating stress levels

"Appointments disrupt my daily responsibilities, but I must prioritize my child's care. I carry her everywhere because she needs constant support." (P10)
"My other child is also affected because I must leave her with neighbors during appointments, and I worry about her care and schooling." (P07),
"Attending appointments affects my ability to work and support my family, but I sacrifice everything for my child." (P06)

Economic burden and its Impact on Family Life: The financial strain exhausted family resources, impacting the entire family system, including siblings. Family dynamics inevitably undergo significant shifts as parents navigate new challenges, redefine roles, and build stronger bonds with their children.
"Coming for rehabilitation is costing and has affected my family's economy because when I come for an appointment means I don't go to work... and other responsibilities are kept on pending..." (P08)
"The cost of services has greatly affected our family's economy because we receive no financial support. Transport alone was very expensive, placing a heavy burden on us." (P07)

DISCUSSION

Access to rehabilitation services is a critical determinant of health and quality of life for children with disabilities and their families. This study explored the lived experiences of parents of children with physical disabilities receiving rehabilitation services at CHUB, highlighting key barriers, outcomes, and coping mechanisms. The findings underscore persistent financial, structural, and social challenges that limit access to care, while also revealing parental resilience and adaptive strategies.

Financial constraints emerged as the most significant barrier to accessing rehabilitation services. Participants consistently reported that the cost of transportation and treatment posed a substantial burden, particularly due to long travel distances and frequent appointments. These findings align with previous studies indicating that financial hardship is a primary determinant of limited access to rehabilitation services in low- and middle-income settings [19], [20]. Similar evidence from Sierra Leone and other contexts highlights transportation costs and poverty as major impediments to service utilization [21]. In Rwanda, where services are often centralized in referral hospitals, these costs are amplified by geographic and infrastructural challenges, further limiting equitable access.

Structural and health system barriers also played a significant role. Participants described long waiting times, shortages of rehabilitation professionals, and inefficiencies in referral pathways, particularly at primary healthcare levels. These findings are consistent with global evidence showing that limited human resources and weak health system integration constrain rehabilitation service delivery [19], [22]. The lack of knowledge among frontline healthcare providers regarding childhood disabilities and referral processes further delays access to care, emphasizing the need for capacity building and system strengthening. Additionally, the absence of rehabilitation services at decentralized levels forces families to travel long distances, increasing both financial and time burdens. This supports prior findings that inadequate distribution of services is a major barrier to accessibility [23].

Limited awareness of rehabilitation services among parents and communities was another critical barrier identified in this study. Many participants reported delayed care-seeking due to lack of knowledge about available services or misunderstanding of their benefits. This finding is consistent with previous research demonstrating that low health literacy significantly influences healthcare utilization among caregivers of children with disabilities [20]. Cultural beliefs and misconceptions surrounding disability further exacerbate this issue, shaping parental decisions and contributing to delayed or foregone care. These results highlight the need for targeted community awareness programs to improve knowledge and promote early intervention.

Social stigma and negative societal attitudes toward disability were also prominent themes. Participants described experiences of discrimination, blame, and harmful beliefs linking disability to moral or supernatural causes. Such stigma not only affects caregivers' psychological well-being but also discourages them from seeking care. These findings are consistent with existing literature showing that stigma contributes to social isolation and reduced access to healthcare for families of children with disabilities [24], [25]. Addressing stigma requires broader societal interventions, including community education, advocacy, and inclusive policies that promote acceptance and support.

In addition to barriers, the study identified positive rehabilitation outcomes. Parents reported noticeable improvements in their children's physical and emotional functioning, which served as strong motivation to continue therapy despite challenges. These findings are consistent with evidence demonstrating the effectiveness of rehabilitation interventions in improving functional outcomes and quality of life among children with disabilities [26]. Beyond child outcomes, rehabilitation services also contributed to parental adaptation, acceptance, and resilience. Exposure to rehabilitation environments and interaction with healthcare providers helped parents better understand their children's conditions and develop coping strategies.

Peer support emerged as a critical facilitator of resilience. Parents described gaining emotional strength and hope through interactions with other caregivers facing similar challenges. These informal support networks provided psychological relief and practical advice, reinforcing findings from previous studies that highlight the importance of social support in enhancing caregiver well-being [27]. Such peer interactions may serve as an important, low-cost intervention to improve caregiver experiences and should be considered in program design.

Despite these positive aspects, the burden of caregiving remained substantial. Parents reported high levels of stress, difficulty balancing caregiving responsibilities with work and household duties, and disruptions to family life. These findings are consistent with studies showing that caring for a child with a disability significantly affects parental mental health, employment, and family dynamics [24], [28]. Economic strain further compounded these challenges, as rehabilitation costs reduced household income and affected the well-being of other family members, including siblings. Similar findings have been reported in other settings, where long-term healthcare expenses lead to financial instability and reduced quality of life [29].

Geographical barriers, particularly in rural areas, further intensified these challenges. Participants described difficulties accessing healthcare facilities due to poor infrastructure and lack of transportation, often requiring long journeys on foot. These findings align with previous research highlighting the role of environmental and infrastructural barriers in limiting access to rehabilitation services [30]. Decentralization of services to community and primary healthcare levels has been widely recommended as a strategy to improve accessibility and reduce costs.

Interestingly, despite the significant challenges identified, parents demonstrated remarkable resilience and adaptability. Many developed coping mechanisms, restructured their daily routines, and maintained strong commitment to their children's care. This contrasts with some literature suggesting that childhood disability may lead to family conflict and dysfunction [23]. Instead, this study highlights the potential for positive adaptation and strengthened family bonds in the face of adversity, consistent with findings from studies exploring parental experiences in similar contexts [27].

The findings of this study have important implications for policy and practice. Addressing financial barriers through social protection mechanisms, such as subsidized transportation or insurance coverage for rehabilitation services, is essential. Strengthening health systems by increasing the rehabilitation workforce, improving referral pathways, and integrating services at primary healthcare levels can enhance accessibility and efficiency. Additionally, community-based awareness programs are needed to improve knowledge, reduce stigma, and promote early care-seeking. Finally, incorporating peer support mechanisms into rehabilitation programs may enhance caregiver well-being and improve overall outcomes.

Strengths and Limitations

This study provides valuable qualitative insights into the experiences of parents of children with physical disabilities in Rwanda, contributing to a limited body of local evidence. However, several limitations should be considered. The study was conducted at a single hospital, which may limit transferability to other settings. The sample included only mothers, excluding perspectives from fathers and other caregivers. Additionally, the small sample size and qualitative design limit generalizability. Future studies with larger and more diverse populations are recommended to further explore these issues.

CONCLUSION

This study demonstrates that parents of children with physical disabilities face substantial barriers in accessing rehabilitation services in Rwanda. Financial limitations, structural constraints in the health system, and social stigma significantly affect access and utilization. Strengthening rehabilitation infrastructure, decentralizing services, increasing workforce capacity, and improving financial protection mechanisms are critical to improving access and outcomes. These findings provide important evidence to inform policymakers, healthcare providers, and stakeholders working to strengthen disability and rehabilitation services in Rwanda and similar settings.

Declarations

Funding: This study was funded by EAC Regional Centre of Excellence in Biomedical Engineering and e-Health (CEBE).

Acknowledgement: The authors express sincere gratitude to the University of Rwanda, CMHS in collaboration with the EAC Regional Centre of Excellence for Biomedical Engineering and eHealth (CEBE). Sincere gratitude to the UR-CMHS Institution Review Board (IRB) for granting ethical clearance and University Teaching Hospital of Butare (CHUB) for granting the approval. We also extend appreciation to all the participants who generously shared their experiences.

Author's contribution: NPM contributed to the proposal writing, data collection, data analysis and interpretation and drafting of the manuscript. NJ contributed in manuscript writing, restructuring, rearrangement of results and the visualization and cleaning of the data. JI, IP, GD, RU and CB contributed in manuscript editing and restructuring. All the authors have critically appraised and approved the final version of the manuscript.

REFERENCES

[1] Word Health Organization, "Disability," Geneva, Switzerland, 2023. [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/disability-and-health

[2] M. Bethge, P. Von Groote, A. Giustini, and C. Gutenbrunner, "The World Report on Disability: A Challenge for Rehabilitation Medicine," Am. J. Phys. Med. Rehabil., vol. 93, no. 1, pp. S4–S11, Jan. 2014, doi: 10.1097/PHM.0000000000000016.

[3] T. Vos et al., "Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019," The Lancet, vol. 396, no. 10258, pp. 1204–1222, Oct. 2020, doi: 10.1016/S0140-6736(20)30925-9.

[4] M. J. W. A. Vanderschuren and O. A. Nnene, "Inclusive planning: African policy inventory and South African mobility case study on the exclusion of persons with disabilities," Health Res. Policy Syst., vol. 19, no. 1, p. 124, Dec. 2021, doi: 10.1186/s12961-021-00775-1.

[5] M. Oskoui, F. Coutinho, J. Dykeman, N. Jetté, and T. Pringsheim, "An update on the prevalence of cerebral palsy: A systematic review and meta-analysis," Dev. Med. Child Neurol., vol. 55, no. 6, pp. 509–519, 2013, doi: 10.1111/dmcn.12080.

[6] G. Urimubenshi, J. Sagahutu, A. Kumurenzi, A. Nuhu, D. Tumusiime, and J. Kagwiza, "Profile of disability in selected districts in Rwanda," Afr. J. Physiother. Rehabil. Sci., vol. 7, no. 1–2, p. 25, 2016, doi: 10.4314/ajprs.v7i1-2.5.

[7] Ministry of Local Government. Republic of Rwanda Ministry of Local Government national policy of persons with disabilities. Kigali: Government of Rwanda; 2021. https://e-ihuriro.rcsprwanda.org/books/national-policy-on-disability-and-inclusion-final/

[8] National Institute of Statistics of Rwanda. Rwanda statistical year book 2022. Kigali: National Institute of Statistics of Rwanda; 2022. http://alpha.statistics.gov.rw/statistical-publications/statistical-yearbook/rwanda-statistical-yearbook-2022

[9] S. Kidd and K. Kabare, "Social Protecti on and Disability in Rwanda," no. August, 2019.

[10] L. J. Michaud, "Prescribing therapy services for children with motor disabilities," Pediatrics, vol. 113, no. 6 I, pp. 1836–1838, 2004, doi: 10.1542/peds.113.6.1836.

[11] U. S. Agency and I. Development, "A Situation Assessment of Rehabilitation In Republic of Rwanda," no. January, 2021.

[12] A. Kumurenzi, J. Richardson, L. Thabane, J. Kagwiza, I. Musabyemariya, and J. Bosch, "Provision and use of physical rehabilitation services for adults with disabilities in Rwanda: A descriptive study," Afr. J. Disabil., vol. 11, pp. 1–13, 2022, doi: 10.4102/AJOD.V11I0.1004.

[13] E. Alabdulqader et al., "Understanding the Therapeutic Coaching Needs of Mothers of Children with Cerebral Palsy," 2022 - Proc. 2022 ACM Des. Interact. Syst. Conf. Digit. Wellbeing, pp. 1788–1801, 2022, doi: 10.1145/3532106.3533576.

[14] N. Shields and A. Synnot, "Perceived barriers and facilitators to participation in physical activity for children with disability : a qualitative study," BMC Pediatr., pp. 1–10, 2016, doi: 10.1186/s12887-016-0544-7.

[15] B. Piškur et al., "The lived experience of parents enabling participation of their child with a physical disability at home, at school and in the community," Disabil. Rehabil., vol. 38, no. 8, pp. 803–812, 2016, doi: 10.3109/09638288.2015.1061612.

[16] N. Gupta, C. Castillo-Laborde, and M. D. Landry, "Health-related rehabilitation services: Assessing the global supply of and need for human resources," BMC Health Serv. Res., vol. 11, 2011, doi: 10.1186/1472-6963-11-276.

[17] S. Campbell, M. Greenwood, S. Prior, K. Walkem, S. Young, and D. Bywaters, "Purposive sampling : complex or simple ? Research case examples," 2020, doi: 10.1177/1744987120927206.

[18] S. K. Ahmed et al., "Using thematic analysis in qualitative research," J. Med. Surg. Public Health, vol. 6, p. 100198, 2025, doi: 10.1016/j.glmedi.2025.100198.

[19] G. A. Asa, N. K. Fauk, L. Mwanri, and P. R. Ward, "Understanding barriers to the access to healthcare and rehabilitation services: A qualitative study with mothers or female caregivers of children with a disability in indonesia," Int. J. Environ. Res. Public. Health, vol. 18, no. 21, 2021, doi: 10.3390/

ijerph182111546.

[20] T. Smythe, M. Zuurmond, C. J. Tann, M. Gladstone, and H. Kuper, "Early intervention for children with developmental disabilities in low and middle-income countries – the case for action," Int. Health, vol. 13, no. 3, pp. 222–231, Apr. 2021, doi: 10.1093/inthealth/ihaa044.

[21] L. Magnusson, I. Kebbie, and V. Jerwanska, "Access to health and rehabilitation services for persons with disabilities in Sierra Leone – focus group discussions with stakeholders," BMC Health Serv. Res., vol. 22, no. 1, p. 1003, Aug. 2022, doi: 10.1186/s12913-022-08366-8.

[22] K. Mishra and V. Siddharth, "Factors Influencing Institutional-Based Pediatric Rehabilitation Services among Caregivers of Children with Developmental Delay in Southwestern Rajasthan," J. Neurosci. Rural Pract., vol. 09, no. 01, pp. 036–041, Jan. 2018, doi: 10.4103/jnrp.jnrp_283_17.

[23] S. Soltani, M. M. Moghadam, S. Amani, S. Akbari, A. Shiani, and M. Soofi, "Socioeconomic disparities in using rehabilitation services among Iranian adults with disabilities: a decomposition analysis," BMC Health Serv. Res., vol. 22, no. 1, p. 1449, Nov. 2022, doi: 10.1186/s12913-022-08811-8.

[24] R. M. Alwhaibi, U. Zaidi, E. Alzeiby, and A. Alhusaini, "A comparative study of socioeconomic status, perceived social support and psychological distress of mothers of children with and without disabilities," Int. J. Ther. Rehabil., vol. 26, no. 9, pp. 1–16, Sep. 2019, doi: 10.12968/ijtr.2018.0019.

[25] A. R. Freeman, "Is Waiting for Rehabilitation Services Associated with Changes in Function and Quality of Life in Children with Physical Disabilities?," Phys. Occup. Ther. Pediatr., vol. 28, no. 4, pp. 305–307, Jan. 2008, doi: 10.1080/01942630802458854.

[26] L. J. Michaud and Committee on Children With Disabilities, "Prescribing Therapy Services for Children with Motor Disabilities," Pediatrics, vol. 113, no. 6, pp. 1836–1838, Jun. 2004, doi: 10.1542/peds.113.6.1836.

[27] A. Gülay, E. Cumalı, and D. Cumalı, "Experiences of Parents of Children with Special Needs in the Process of Receiving Reports from Guidance and Research Centers," Int. J. Contemp. Educ. Res., vol. 11, no. 3, pp. 337–353, Sep. 2024, doi: 10.52380/ijcer.2024.11.3.638.

[28] M. Y. Wondemu, P. Joranger, Å. Hermansen, and I. Brekke, "Impact of child disability on parental employment and labour income: a quasi-experimental study of parents of children with disabilities in Norway," BMC Public Health, vol. 22, no. 1, p. 1813, Sep. 2022, doi: 10.1186/s12889-022-14195-5.

[29] M. E. O'Neil, T. E. Costigan, E. J. Gracely, and N. Wells, "Parents' Perspectives on Access to Rehabilitation Services for Their Children with Special Healthcare Needs," Pediatr. Phys. Ther., vol. 21, no. 3, pp. 254–260, 2009, doi: 10.1097/PEP.0b013e3181b17566.

[30] E. Karangwa, S. Miles, and I. Lewis, "Community□level Responses to Disability and Education in Rwanda," Int. J. Disabil. Dev. Educ., vol. 57, no. 3, pp. 267–278, Sep. 2010, doi: 10.1080/1034912X.2010.501183.

Original Article

Open Access

The impact of establishing a regional anesthesia block room on the perioperative journey at a major teaching hospital in Rwanda, 2025

Jean Damascène Nyandwi[1], Eugène Tuyishime[2,*], Gaston Nyirigira[3], Samuel Muhumuza[1], Joêl B. Bikoroti[4], Milena Bullen[5], Christopher Haley[5], Gregory Klar[5], Ana Johnson[6], Joel Parlow[5]

[1]Anesthesia and Critical Care department, Centre Hospitalier Universitaire de Kigali, Kigali, Rwanda
[2]Department of Anesthesia, Critical Care and Emergency Medicine, University of Rwanda
[3]Anesthesia and Critical Care department, King Faisal Hospital, Kigali, Rwanda
[4]Department of Surgery, University Teaching Hospital of Kigali, Kigali, Rwanda
[5]Department of Anesthesiology and Perioperative Medicine, Queen's University, Kingston, ON, Canada
[6]Department of Public Health Sciences, Queen's University, Kingston, ON, Canada

***Corresponding author:**
Eugene Tuyishime
Department of Anesthesia, Critical Care and Emergency Medicine, University of Rwanda,

Email: tuyishime36@gmail.com

Received: February 13, 2026
Accepted: March 25, 2026
Published: March 31, 2026

Cite this article as: Nyandwi et al. The impact of establishing a regional anesthesia block room on the perioperative journey at a major teaching hospital in Rwanda, 2025. *Rw. Public Health Bul. 2026. 7 (1): 35-41. https://dx.doi.org/10.4314/rphb.v7i1.5*

ABSTRACT

INTRODUCTION: Regional anesthesia offers important advantages over general anesthesia, including improved analgesia, fewer perioperative complications, and enhanced operating room (OR) efficiency. However, evidence on the implementation and impact of regional anesthesia block rooms (BRs) in low-resource settings remains limited. This study evaluated the effect of establishing a BR on perioperative efficiency at a tertiary teaching hospital in Rwanda.

METHODS: This quality improvement study employed a pre–post implementation design guided by the Plan–Do–Study–Act (PDSA) framework and reported in accordance with SQUIRE 2.0 guidelines. Conducted at Centre Hospitalier Universitaire de Kigali between May and October 2023, the study compared perioperative time metrics before and after BR implementation. Outcomes included peripheral nerve block (PNB) duration, time from PNB completion to incision, surgical duration, and post-anesthesia care unit (PACU) stay. Data were analyzed using descriptive statistics and inferential tests, with significance set at $p < 0.05$.

RESULTS: A total of 46 patients were included (20 pre-implementation, 26 post-implementation), with comparable baseline characteristics across groups. The introduction of the BR was associated with a significant increase in surgical time (88.4 ± 77.9 vs. 101.5 ± 37.3 minutes; $p < 0.05$), corresponding to a mean gain of 13.1 minutes per case. No significant differences were observed in PNB duration, PNB-to-incision time, or PACU length of stay. No complications related to regional anesthesia were reported.

CONCLUSION: The implementation of a BR in a resource-limited setting is feasible and improves OR efficiency without compromising patient safety. Scaling such interventions requires investment in workforce capacity, structured training, and improved perioperative coordination.

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

INTRODUCTION

Regional anesthesia has become an essential component of modern perioperative care, particularly in obstetric, trauma, and orthopedic surgery, where it is associated with improved clinical outcomes and system efficiency [1–3]. Compared with general anesthesia, regional techniques reduce perioperative airway and respiratory complications, provide superior analgesia, shorten post-anesthesia care unit (PACU) stay, and enhance operating room (OR) efficiency [1,3]. These advantages are especially relevant in resource-limited settings, where optimizing efficiency and patient safety is critical.

In high-income countries, regional anesthesia services are well established, supported by dedicated regional anesthesia and acute pain management (RAAPM) training programs and the use of block rooms (BRs) to facilitate parallel processing of care [4]. A block room allows peripheral nerve blocks (PNBs) to be performed outside the operating room, thereby minimizing delays and improving workflow efficiency [5–7]. This model has been shown to reduce anesthesia-controlled time, improve patient flow, and increase surgical throughput [5,8].

In contrast, the adoption of structured regional anesthesia services in sub-Saharan Africa remains limited. Although progress has been reported in several countries including Ghana, Uganda, Rwanda, and Ethiopia, implementation is often constrained by shortages of trained personnel, inconsistent availability of consumables, and limited institutional support [8–10]. In Rwanda, while ultrasound-guided PNBs are increasingly practiced, their use remains inconsistent due to variability in expertise and resource availability.

At Centre Hospitalier Universitaire de Kigali (CHUK), a previous attempt to establish a block room in 2016 was unsuccessful due to staffing constraints, inadequate supplies, and limited local ownership. Importantly, block room models developed in high-resource environments are not directly transferable without contextual adaptation [11,12].

To address these gaps, a quality improvement initiative was undertaken to implement a context-adapted block room at CHUK. This study aimed to evaluate the impact of this intervention on the perioperative journey, specifically assessing its effect on efficiency within the Surgical Preparation Unit (SPU), operating room, and PACU. The findings provide context-specific evidence on the feasibility and effectiveness of block room implementation in a low-resource setting and may inform scale-up strategies in similar environments.

METHODS

Study Design

This study was conducted as a quality improvement project using a pre–post implementation design guided by the Plan–Do–Study–Act (PDSA) framework. Reporting followed the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) guidelines [16]. The project was implemented over four phases between February and October 2023.

Study Setting

The study was conducted at Centre Hospitalier Universitaire de Kigali (CHUK), a tertiary referral and teaching hospital in Kigali, Rwanda, serving a population of over 6.2 million people. The hospital has approximately 513 beds and provides comprehensive medical and surgical services. The anesthesia department consists of 10 anesthesiologists and 10 rotating residents, supporting eight operating rooms and more than 10,000 surgical procedures annually. Regional anesthesia is performed by anesthesiologists and supervised residents.

Intervention and Implementation (PDSA Cycles)

Plan Phase (May–June 2023): Baseline perioperative workflows were assessed prior to implementation. In the standard process, patients requiring peripheral nerve blocks were transferred from the Surgical Preparation Unit (SPU) to the operating room, where blocks were performed after initiation of anesthesia monitoring and intravenous access. This workflow contributed to delays and inefficiencies within the OR.

Stakeholder engagement was conducted through a series of meetings involving hospital leadership, anesthesia and surgery department heads, nursing leadership, and pharmacy representatives. These discussions aimed to define roles, secure institutional support, and allocate space and resources for the block room. Baseline data on perioperative timelines were collected over eight weeks to inform process redesign.

Do Phase (July 2023): A dedicated block room was established within the preoperative holding area, equipped with two beds, monitoring devices, an ultrasound machine, and essential supplies for regional anesthesia. Preoperative assessment identified eligible patients for PNBs, and informed consent was obtained.

On the day of surgery, patients were transferred from the SPU to the block room, where standard ASA monitoring and intravenous access were established prior to performing and confirming successful nerve blocks. Patients were then transferred to the operating room for surgery, followed by routine transfer to PACU postoperatively. Process refinements included reallocating a non-physician anesthetist to PACU to facilitate patient flow and reduce discharge delays.

Study Phase (August–September 2023): Perioperative time metrics were prospectively collected using the same methodology as the baseline phase. These included timestamps for patient movement through SPU, block room, operating room, and PACU. Key outcome measures included: Peripheral Nerve Block (PNB) duration; time from PNB completion to surgical incision; surgical duration (incision to closure); and PACU length of stay.

Act Phase (September 2023 onward): Post-implementation evaluation identified areas for improvement, including the need for consistent staffing of the block room and improved scheduling coordination. Strategies under consideration include dedicated staffing models and enhanced surgical planning to optimize block room utilization.

Study Population

The study included all adult patients undergoing elective orthopedic surgery under regional anesthesia during the study period. Emergency cases and patients who declined consent were excluded.

Sample Size

A total of 46 eligible patients were included during the implementation phase (August–September 2023). The sample size was determined by feasibility constraints, including limited block room operational days and staffing capacity. Given that the intervention was delivered by two anesthesiologists working on alternating schedules, the risk of systematic selection bias was considered low. However, temporal variations in case complexity and resource availability may have introduced variability.

Data Collection and Analysis

Data were collected prospectively using standardized data collection forms and analyzed using STATA version 15.0 (StataCorp, USA). Categorical variables were summarized using frequencies and percentages, while continuous variables were described using means and standard deviations.

Comparisons between pre- and post-intervention periods were performed using the chi-square test for categorical variables and the independent t-test for continuous variables. Statistical significance was defined as a p-value < 0.05.

Ethical Considerations

Ethical approval was obtained from the CHUK Institutional Review Board (EC/CHUK/031/2023). Written informed consent was obtained from all participants prior to inclusion.

RESULTS

Participant Characteristics

A total of 46 patients were included in the analysis, with 20 patients in the pre-implementation group and 26 in the post-implementation group. There were no statistically significant differences in baseline characteristics between the two groups, indicating comparability. The mean age was similar before and after block room (BR) implementation (40.7 ± 17.2 vs. 42.9 ± 18.9 years; $p > 0.05$). The sex distribution was also comparable, with males accounting for 60.0% (n = 12) before and 57.7% (n = 15) after implementation ($p > 0.05$). The spectrum of surgical diagnoses was broadly similar across both groups, with upper limb fractures being the most common indications. Likewise, the types of regional anesthesia techniques performed did not differ significantly between groups ($p > 0.05$), with supraclavicular and interscalene blocks being the most frequently used approaches. No complications related to peripheral nerve blocks (PNBs) were reported in either period (0% vs. 0%) (Table 1).

Table 1: *Characteristics of patients undergoing regional anesthesia at CHUK before (N:20) and after (N:26) BR initiation*

Variable	**Before BR (n = 20)**	**After BR (n = 26)**	**P-value**
Age (years), mean ± SD	40.7 ± 17.2	42.9 ± 18.9	>0.05
Sex, n (%)			
Male	12 (60.0)	15 (57.7)	>0.05
Female	8 (40.0)	11 (42.3)	
Diagnosis, n (%)			
Radius fracture	4 (20.0)	4 (15.4)	>0.05
Humerus fracture	8 (40.0)	8 (30.8)	
Ulna fracture	1 (5.0)	1 (3.8)	
Forearm laceration	1 (5.0)	2 (7.7)	
Metacarpal fracture	1 (5.0)	2 (7.7)	
Finger injury	1 (5.0)	1 (3.8)	
Elbow dislocation	1 (5.0)	1 (3.8)	
Diabetic foot	1 (5.0)	1 (3.8)	
Leg ulcer	1 (5.0)	0 (0.0)	
Foot tumour	1 (5.0)	0 (0.0)	
Others*	0 (0.0)	6 (23.1)	
Regional anesthesia technique, n (%)			
Interscalene	7 (35.0)	8 (30.8)	>0.05
Supraclavicular	7 (35.0)	12 (46.2)	
Axillary	3 (15.0)	1 (3.8)	
Adductor canal / Popliteal	3 (15.0)	5 (19.2)	
Complications, n (%)			
Yes	0 (0.0)	0 (0.0)	>0.05
No	20 (100)	26 (100)	

Others#: ankle fracture, implant removal, arm tumor, crash injury of the arm

Perioperative Time Outcomes

The implementation of the block room was associated with a significant increase in surgical time available in the operating room. As seen in Table 2, mean surgical duration increased from 88.4 ± 77.9 minutes before implementation to 101.5 ± 37.3 minutes after implementation, representing a mean gain of 13.1 minutes per case ($p < 0.05$). In contrast, there were no statistically significant differences observed in other perioperative time intervals. The mean duration of PNB procedures remained comparable between groups (31.0 ± 12.3 vs. 32.7 ± 8.9 minutes; $p > 0.05$). Similarly, the time from PNB completion to surgical incision showed no significant change (28.75 ± 14.6 vs. 24.5 ± 11.1 minutes; $p > 0.05$). Postoperative recovery time in the PACU was also similar before and after the intervention (70.7 ± 34.9 vs. 67.2 ± 44.7 minutes; $p > 0.05$).

Safety Outcomes

No complications related to regional anesthesia were observed during either the pre-implementation or post-implementation periods. This finding suggests that the introduction of the block room did not compromise patient safety while improving operating room efficiency.

DISCUSSION

This study demonstrates that implementing a context-adapted regional anesthesia BR in a resource-limited tertiary hospital is feasible and associated with measurable improvements in operating room efficiency. Specifically, the intervention resulted in a statistically significant increase in surgical time available per case (+13.1 minutes), without compromising procedural duration, recovery time, or patient safety. These

Table 2: *Comparison of Perioperative Time Outcomes Before and After Block Room Implementation*

Outcome (minutes)	Before BR (Mean ± SD)	After BR (Mean ± SD)	P-value
PNB duration	31.0 ± 12.3	32.7 ± 8.9	>0.05
PNB completion to incision	28.75 ± 14.6	24.5 ± 11.1	>0.05
Surgical time (OR time)	88.4 ± 77.9	101.5 ± 37.3	<0.05
PACU stay	70.7 ± 34.9	67.2 ± 44.7	>0.05

BR=Block Room, OR = Operating Room, PNB = Peripheral Nerve Block, PACU = Post-Anesthesia Care Unit, SD=Standard Deviation. Surgical time was defined as the time in the OR controlled by the surgeon (Time from skin incision to completion of the final suture).

findings suggest that reorganizing perioperative workflows through parallel processing can yield meaningful efficiency gains even in constrained health systems.

The observed improvement in surgical time aligns with evidence from high-income settings, where block rooms have consistently been associated with reductions in anesthesia-controlled time and enhanced operating room throughput [5,13,14]. The principle underlying these gains, parallel processing of anesthesia and surgical preparation, allows non-operative tasks to occur outside the operating room, thereby maximizing its utilization [15]. Our findings extend this evidence to a low-resource context, demonstrating that similar efficiency benefits can be achieved despite limited infrastructure and workforce constraints.

However, unlike some studies that reported reductions in anesthesia-controlled time and turnover intervals, we did not observe significant changes in PNB duration or PNB-to-incision time. This finding is consistent with Eappen et al. [16], who reported that introducing a regional block team did not necessarily reduce anesthesia-controlled times in settings with pre-existing workflow inefficiencies. In our context, this may reflect persistent system-level constraints, including staffing limitations, variability in case complexity, and logistical coordination challenges. These findings underscore that while block rooms can improve certain aspects of efficiency, their full impact depends on broader system optimization.

Importantly, the absence of complications in both study periods reinforces the safety of regional anesthesia delivery within a structured block room model. This is consistent with established guidelines emphasizing the importance of appropriate monitoring, dedicated space, and trained personnel in maintaining safety standards [7,17]. The findings suggest that introducing efficiency-driven models does not inherently compromise care quality when implemented within a robust clinical governance framework.

A key contribution of this study lies in demonstrating the importance of contextual adaptation in implementing health system innovations. Previous attempts to establish a block room at CHUK were unsuccessful due to limited staffing, inadequate supplies, and lack of ownership, which are barriers similarly reported in other low-income settings [12,18]. In contrast, the success of the current initiative was underpinned by deliberate stakeholder engagement, iterative process refinement through the PDSA framework, and the identification of local clinical champions.

These findings highlight that implementation success in resource-limited settings is less dependent on infrastructure alone and more on governance, ownership, and workflow redesign. The ability to adapt global best practices to local realities is critical, particularly in environments where workforce shortages and competing priorities are pervasive.

The improvement in surgical efficiency observed in this study has important implications for health system performance in LMICs. In settings where surgical capacity is constrained, even modest gains in efficiency can translate into increased surgical throughput, reduced waiting times, and improved access to care. From a policy perspective, the findings support the integration of regional anesthesia services into broader surgical system strengthening strategies. However, the distribution of costs and benefits must be carefully considered. While the establishment of a block room may place additional demands on anesthesia departments, the benefits, such as improved operating room utilization and increased surgical output, are realized at the institutional level [19,20]. This underscores the need for coordinated institutional support and cross-departmental investment.

Furthermore, strengthening training pathways in regional anesthesia, including the development of structured rotations or fellowship programs, may enhance sustainability. Building local capacity is essential not only for maintaining block room functionality but also for scaling such interventions across other hospitals in Rwanda and similar contexts.

This study has several strengths. It represents one of the first evaluations of block room implementation in a sub-Saharan African setting and applies a structured quality improvement framework (PDSA) with standardized reporting (SQUIRE). The use of real-world data enhances the relevance of the findings for similar health systems.
However, several limitations should be considered. First, the study was conducted at a single center with a relatively small sample size, which may limit generalizability and increase the risk of type II error. Second, the short follow-up period may not fully capture the long-term impact of the intervention or its sustainability. Third, the absence of multivariable adjustment limits the ability to account for potential confounding factors, such as case complexity or provider variability. Finally, operational constraints, including inconsistent staffing of the block room, may have attenuated the observed effects.
Future research should focus on evaluating the long-term sustainability and scalability of block room implementation in similar settings. Larger, multicenter studies are needed to confirm these findings and explore additional outcomes, including cost-effectiveness, patient satisfaction, and training impact. There is also a need to investigate system-level interventions—such as workforce optimization, scheduling coordination, and integrated perioperative pathways—that may enhance the effectiveness of block rooms.

CONCLUSION

The implementation of a regional anesthesia block room at CHUK demonstrates that context-adapted perioperative innovations can improve operating room efficiency without compromising patient safety in resource-limited settings. While the magnitude of improvement was modest, the findings provide important proof of concept that workflow redesign can contribute to strengthening surgical systems in LMICs. Sustained impact will depend on continued investment in workforce capacity, institutional support, and system-wide optimization. To enhance impact and scalability, the following actions are recommended: establishing dedicated staffing models for block room operations to ensure consistency and maximize efficiency gains; strengthening training programs in regional anesthesia, including structured rotations and fellowships, to build sustainable local expertise; and improving surgical scheduling and coordination to cluster patients requiring regional anesthesia, thereby optimizing block room utilization.

REFERENCES

[1] J. Gadsden and A. Warlick, "Regional anesthesia for the trauma patient: improving patient outcomes," Local Reg. Anesth., p. 45, Aug. 2015, doi: 10.2147/LRA.S55322.
[2] L. Dohlman, A. Kwikiriza, and O. Ehie, "Benefits and Barriers to Increasing Regional Anesthesia in Resource-Limited Settings," Local Reg. Anesth., vol. Volume 13, pp. 147–158, Oct. 2020, doi: 10.2147/LRA.S236550.
[3] American Society of Anesthesiology, "Practice Guidelines for Obstetric Anesthesia: An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology*," Anesthesiology, vol. 124, no. 2, pp. 270–300, Feb. 2016, doi: 10.1097/ALN.0000000000000935.
[4] S. Ravindranath, Y. S. Ranganath, K. Backfish-White, J. Wolfe, and S. Adhikary, "The Role of Regional Anaesthesia and Acute Pain Services in Value-Based Healthcare," Turk. J. Anaesthesiol. Reanim., vol. 51, no. 6, pp. 450–458, Dec. 2023, doi: 10.4274/TJAR.2023.231478.
[5] B. Brown, E. Khemani, C. Lin, and K. Armstrong, "Improving patient flow in a regional anaesthesia block room," BMJ Open Qual., vol. 8, no. 2, p. e000346, Apr. 2019, doi: 10.1136/bmjoq-2018-000346.
[6] B. Sites, "Ultrasound guidance in regional anesthesia: state of the art review through challenging clinical scenarios," Local Reg. Anesth., p. 1, Jan. 2009, doi: 10.2147/LRA.S3444.
[7] M. Chazapis, N. Kaur, and D. Kamming, "Improving the Peri-operative care of Patients by instituting a 'Block Room' for Regional Anaesthesia," BMJ Qual. Improv. Rep., vol. 3, no. 1, p. u204061.w1769, 2014, doi: 10.1136/bmjquality.u204061.w1769.
[8] P. K. Hamal, A. J. Rayamajhi, N. Pokhrel, R. K. Yadav, P. R. Bhattarai, and N. R. Bista, "Can

Ultrasound Guided Regional Anesthesia Improve Rural Anesthesia Services and Address Safety Issues in Low Income Country? Perspective from Nepal," J. Nepal Health Res. Counc., vol. 18, no. 1, pp. 144–146, Apr. 2020, doi: 10.33314/jnhrc.v18i1.2614.

[9] A. Rukewe and A. Fatiregun, "The Use of Regional Anesthesia by Anesthesiologists in Nigeria," Anesth. Analg., vol. 110, no. 1, pp. 243–244, Jan. 2010, doi: 10.1213/ANE.0b013e3181c0f00e.

[10] M. A. Brouillette et al., "Anesthesia Capacity in Ghana: A Teaching Hospital's Resources, and the National Workforce and Education," Anesth. Analg., vol. 125, no. 6, pp. 2063–2071, Dec. 2017, doi: 10.1213/ANE.0000000000002487.

[11] J. Toor et al., "An Anesthesia Block Room Is Financially Net Positive for a Hospital Performing Arthroplasty," J. Am. Acad. Orthop. Surg., vol. 30, no. 15, pp. e1058–e1065, Aug. 2022, doi: 10.5435/JAAOS-D-21-01217.

[12] M. Ho et al., "Barriers and facilitators to implementing a regional anesthesia service in a low-income country: a qualitative study," Pan Afr. Med. J., vol. 32, 2019, doi: 10.11604/pamj.2019.32.152.17246.

[13] T. B. Folino and S. K. Mahboobi, "Regional Anesthetic Blocks," in StatPearls, Treasure Island (FL): StatPearls Publishing, 2026. Accessed: Apr. 07, 2026. [Online]. Available: http://www.ncbi.nlm.nih.gov/books/NBK563238/

[14] G. Patel, S. Kahlon, S. Chipre, and V. Anand, "Block room implementation for regional anesthesia: a quality improvement and predictive modeling study on operating room efficiency in a tertiary orthopedic center," Perioper. Care Oper. Room Manag., vol. 42, p. 100597, Mar. 2026, doi: 10.1016/j.pcorm.2025.100597.

[15] B. M. Ilfeld and G. A. Liguori, "Regional Anesthesia 'Block Rooms': Should They Be Universal? Look to Goldilocks (and Her 3 Bears) for the Answer," Reg. Anesth. Pain Med., vol. 42, no. 5, pp. 551–553, 2017, doi: 10.1097/AAP.0000000000000648.

[16] S. Eappen, H. Flanagan, R. Lithman, and N. Bhattacharyya, "The addition of a regional block team to the orthopedic operating rooms does not improve anesthesia-controlled times and turnover time in the setting of long turnover times," J. Clin. Anesth., vol. 19, no. 2, pp. 85–91, Mar. 2007, doi: 10.1016/j.jclinane.2006.04.010.

[17] A. Chin, L. Heywood, P. Iu, A. M. Pelecanos, and M. J. Barrington, "The Effectiveness of Regional Anaesthesia before and after the Introduction of a Dedicated Regional Anaesthesia Service Incorporating a Block Room," Anaesth. Intensive Care, vol. 45, no. 6, pp. 714–719, Nov. 2017, doi: 10.1177/0310057X1704500611.

[18] Y. Hammad et al., "Inauguration of a Successful Block Room at a Tertiary Care Facility: Different Plans and a Different Outcome," J. Clin. Anesth., vol. 4, p. 2020, Aug. 2020, doi: 10.37421/JCAO.2020.4.119.

[19] R. M. Rosenblatt and R. Shal, "The Design and Function of a Regional Anesthesia Block Room," Reg. Anesth. Pain Med., vol. 9, pp. 12–16, 1984.

[20] J. C. Cendán, "Interdisciplinary Work Flow Assessment and Redesign Decreases Operating Room Turnover Time and Allows for Additional Caseload," Arch. Surg., vol. 141, no. 1, p. 65, Jan. 2006, doi: 10.1001/archsurg.141.1.65.

Policy Evaluation Open Access

Rwanda Public Health Bulletin

Strengthening Rwanda's Antimicrobial Resistance Response: A Policy Evaluation and Recommendations, 2025

Merveille Uwihirwe[1,*], Yves Gashugi[1], Soleil Ishimwe[1]

[1]*University of Global Health Equity (UGHE), Burera, Rwanda*

***Corresponding author:**
Merveille Uwihirwe

Email: uwihimerve@gmail.com

University of Global Health Equity (UGHE), Burera, Rwanda

Received: February 6, 2026
Accepted: March 27, 2026
Published: March 31, 2026

Cite this article as: Uwihirwe et al. Strengthening Rwanda's Antimicrobial Resistance Response: A Policy Evaluation and Recommendations, 2025. *Rw. Public Health Bul. 2026. 7 (1): 42-49. https://dx.doi.org/10.4314/rphb.v7i1.4*

ABSTRACT

INTRODUCTION: Antimicrobial resistance (AMR) threatens public health, food safety, and economic stability, with low- and middle-income countries like Rwanda disproportionately affected. AMR leads to resistant infections in humans and animals, increasing morbidity, mortality, and healthcare costs.

METHODS: A qualitative policy evaluation was conducted using a literature and policy review of Rwanda's National Action Plans (NAP 1: 2020–2024; NAP 2: 2025–2029) and global evidence on AMR control. Four policy options (strengthening surveillance, regulating livestock antimicrobial use, enforcing prescription-only antibiotic sales, and maintaining the status quo) were assessed using criteria including equity, sustainability, efficacy, value for money, and One Health alignment.

RESULTS: Policy evaluation of four alternatives strengthening AMR surveillance, regulating livestock antimicrobial use, enforcing prescription-only antibiotic sales, and maintaining the status quo shows that enhanced surveillance is most equitable, sustainable, and holistic. Livestock regulation ranks highest in efficacy and cost-effectiveness, while doing nothing risks worsening the AMR burden.

CONCLUSION: Rwanda should prioritize establishing a decentralized, multisectoral AMR surveillance system integrating human, animal, and environmental data, supported by livestock antimicrobial regulation and strict enforcement of prescription-only antibiotic sales.

INTRODUCTION

Antimicrobial resistance (AMR) occurs when microorganisms, including bacteria, parasites, viruses, and fungi, develop the ability to resist antimicrobial agents designed to kill them [1]. Globally, AMR was responsible for an estimated 1.27 million deaths and was associated with 4.95 million deaths in 2019 [2]. Low- and middle-income countries (LMICs) are disproportionately affected due to weaker health systems, limited laboratory capacity, and widespread misuse of antibiotics [3].

Rwanda faces a growing AMR burden. Studies have reported increasing resistance to commonly used antibiotics, including ceftriaxone, ampicillin, and ciprofloxacin [4], with additional reports of multidrug-resistant infections among hospitalized patients [5], high rates of bloodstream infections with resistant bacteria [6], and emerging artemisinin partial resistance in Plasmodium falciparum infections [7]. Evidence also indicates high levels of antimicrobial use in animals, contributing to the transmission of resistant pathogens to humans [8, 10]. AMR threatens public health, food safety, and economic stability. Globally, AMR could push 24 million people into extreme poverty by 2030 and reduce global GDP by up to US$3.4 trillion annually if not addressed [11,12]. Rwanda has implemented the first National Action Plan (NAP 1), but only 34% of planned activities were achieved [13]. The proposed NAP 2 (2025–2029) risks similar shortfalls if gaps such as weak surveillance, misuse of antimicrobials in livestock, and over-the-counter antibiotic sales are not addressed [14,15].

Therefore, the purpose of this policy evaluation is to identify gaps in Rwanda's current AMR response and assess the effectiveness, sustainability, equity, and feasibility of potential interventions. By analyzing key policy options, this study aims to provide evidence-based recommendations to strengthen national surveillance, regulate antimicrobial use in humans and livestock, and curb over-the-counter sales of antibiotics.The goal is to support Rwanda in implementing a robust, coordinated, and sustainable AMR strategy that protects public health and aligns with global standards.

METHODS

This study employed a qualitative policy evaluation approach to assess strategies for strengthening antimicrobial resistance (AMR) control in Rwanda. The analysis was guided by commonly used frameworks in global health policy evaluation. A policy analysis and comparative assessment design was used to evaluate existing AMR policies and identify potential interventions. The study involved three main steps.

First, a literature review was conducted to examine Rwanda's current AMR response and global evidence on effective AMR control strategies. Key national policy documents reviewed included the Rwanda National Action Plan on Antimicrobial Resistance (NAP 1: 2020–2024) and the National Action Plan on Antimicrobial Resistance (NAP 2: 2025–2029). These were complemented by international guidelines and reports from the World Health Organization (WHO) and other global health agencies. Peer-reviewed studies from databases such as PubMed and Google Scholar were also examined to identify evidence on AMR drivers and effective policy interventions implemented in other countries.

Second, the policy and literature review were used to identify major gaps in Rwanda's AMR response. The analysis highlighted three key challenges: weak AMR surveillance systems, misuse of antimicrobials in livestock production, and widespread over-the-counter sales of antibiotics without prescription.

Third, policy alternatives were developed and comparatively assessed based on these identified gaps and evidence from global best practices. Four policy options were evaluated: strengthening AMR surveillance systems, regulating antimicrobial use in livestock, enforcing the prohibition of over-the-counter antibiotic sales, and maintaining the current approach without additional interventions.

Each policy option was evaluated using five criteria commonly applied in health policy analysis: equity, sustainability, efficacy, value for money, and a holistic approach aligned with the One Health framework, which integrates human, animal, and environmental health sectors. These criteria were used to compare the potential impact of each policy option in addressing antimicrobial resistance in Rwanda.

The results of this evaluation are presented in Table 1, where policy options are scored using a qualitative three-level scale: + (low contribution), ++ (moderate contribution), and +++ (high contribution). These scores were assigned based on the strength of evidence from the reviewed literature, policy reports, and documented experiences from other countries implementing similar AMR interventions. These criteria were selected based on widely used frameworks in health policy analysis and global health decision-making based on evidence from published literature, international guidelines, and policy reports.

This policy review was based solely on the review and analysis of publicly available policy documents, reports, and peer-reviewed literature related to antimicrobial resistance in Rwanda. No human participants, interviews, surveys, or primary data collection were involved in this policy evaluation. Therefore, ethical approval from an institutional review board was not required. All sources used in the study have been appropriately cited to ensure academic integrity and transparency.

RESULTS

Gaps in AMR Control in Rwanda

In Rwanda, AMR caused 2,400 deaths and contributed to 9,800 deaths in 2019, ranking the country 34th out of 204 nations in age-standardized mortality rates related to AMR [16].

Despite Rwanda's efforts through the first National Action Plan (NAP 1), several critical gaps persist in mitigating AMR.

Weak AMR Surveillance Systems: Local surveillance data reveal alarming resistance patterns. A retrospective study at Kigali University Teaching Hospital (CHUK) from 2017–2018 reported multidrug resistance of 77.1% in 341 positive blood cultures, particularly against penicillin, ampicillin, and trimethoprim-sulfamethoxazole [4]. Moreover, 75.9% of 241 gram-negative isolates from urine, blood, sputum, and wound samples showed resistance to ceftriaxone in 2019 [5]. Bizimungu et al. [6] further highlighted high rates of AMR among gram-negative bacteria and the emergence of carbapenem resistance, while Schreidah et al. [7] detected partial artemisinin resistance in Plasmodium falciparum infections, affecting malaria control. NAP 1 also revealed gaps in laboratory capacity, biosafety standards, data quality, and reporting mechanisms [14]. Only a limited number of laboratories participate in systematic AMR surveillance, and reporting to WHO GLASS remains fragmented [1]. Strong surveillance systems in other countries have been shown to reduce morbidity, mortality, and inappropriate antibiotic use [17, 18], emphasizing the urgent need for Rwanda to strengthen monitoring and reporting frameworks.

Misuse of Antimicrobials in Livestock Production: Antimicrobial use in livestock significantly contributes to the emergence and transmission of resistant pathogens to humans. Resistance to tetracycline was reported at 35.6% among animals in Rwanda's Eastern Province in 2019 [8]. Extensive use of antibiotics for growth promotion and disease prevention in animals has been documented in LMICs, including Rwanda [19]. Such misuse facilitates the emergence of resistant bacteria such as E. coli and Salmonella [8]. Evidence from the European Union demonstrates that restricting antimicrobial use in livestock significantly reduces resistance transmission, improving both human and animal health outcomes [9,20]. AMR from livestock also impacts food safety and productivity, creating broader societal and economic risks [1,21].

Over-the-Counter (OTC) Sales of Antibiotics: The availability of antibiotics without prescription remains a significant driver of AMR in Rwanda. A study in Kigali found that 73% of pharmacies dispensed antibiotics without prescriptions [22], despite regulatory frameworks prohibiting such practices [23]. Globally, strict enforcement of OTC bans has been shown to reduce antibiotic misuse and slow the spread of resistant strains [13, 24]. Failure to regulate OTC sales undermines national AMR strategies and increases the risk of treatment failures, prolonged hospitalization, and additional healthcare costs [1, 21].

Broader Public Health and Economic Impacts

AMR threatens human health, animal health, and the environment, leading to infections that are increasingly difficult or impossible to treat. Such infections require costly second- or third-line therapies and longer hospital stays [1]. Globally, AMR could cause economic losses of $300 billion to $1 trillion by 2050 [16], disproportionately affecting LMICs due to high infectious disease prevalence and labor dependence [21]. The overuse of antibiotics in livestock exacerbates these challenges through transmission of resistant zoonotic pathogens [1]. These gaps underscore the urgent need for strengthened AMR surveillance, regulation of antimicrobial use in humans and animals, enforcement of OTC bans, and multisectoral interventions in Rwanda.

Current Approaches to AMR Control in Rwanda

Following the 68th World Health Assembly in 2015, which urged countries to develop National Action Plans (NAPs) on antimicrobial resistance (AMR), Rwanda established its first NAP on AMR (NAP 1.0) covering the period 2020–2024 [14]. NAP 1.0 adopted a One Health approach, addressing AMR through enhanced awareness, surveillance, infection prevention and control, sustainable investment, and regulation of antimicrobial use across human, animal, and environmental health sectors [14]. However, an evaluation by the Republic of Rwanda indicated that only 34% of planned actions were fully implemented [15]. Key gaps included incomplete mapping of antimicrobial distribution pathways, limited laboratory capacity, and inadequate data management within the animal health sector [15].

To address these shortcomings, Rwanda developed NAP 2 for the period 2025–2029, spearheaded by the Rwanda Biomedical Center (RBC) in collaboration with the Food and Agriculture Organization of the United Nations (FAO) [3]. NAP 2 emphasizes the establishment of a comprehensive surveillance system, detailed mapping of antimicrobial distribution, and pilot studies to strengthen data collection and analysis [6]. While NAP 2 demonstrates a more structured and comprehensive approach, its success depends heavily on effective implementation. Current evidence suggests that AMR remains underreported outside teaching hospitals, indicating persistent surveillance gaps [25]. Therefore, coordinated and actionable interventions are urgently needed to reduce the burden of AMR in Rwanda.

Call for Action: Policy Alternatives for Strengthening AMR Control in Rwanda

Option 1: *Establish a Stronger AMR Surveillance System in Human and Veterinary Medicine*

A robust AMR surveillance system is essential to detect resistance patterns and respond with timely interventions [17]. Weak surveillance allows resistant bacteria to spread silently, exacerbating AMR [21]. Establishing a national AMR surveillance system accessible to healthcare providers and veterinary specialists is crucial. This system should be decentralized to district hospitals and veterinary posts, equipped to detect resistant pathogens promptly. For example, Nepal implemented a One Health AMR surveillance system in sentinel hospitals and veterinary laboratories, which facilitated the detection of multidrug-resistant Vibrio cholerae and informed antibiotic stewardship [26].

Advantages: Effective surveillance provides data to track AMR trends, informing infection prevention and control policies nationally and contributing to WHO GLASS reporting [27].

Disadvantages: Implementation requires advanced diagnostics, skilled personnel, and funding, which could strain national budgets without external support from stakeholders such as the private sector, NGOs, WHO, and other international organizations [18].

Option 2: *Regulate Antimicrobial Use in Livestock*

The overuse of antibiotics in animals for growth promotion, treatment, and prophylaxis contributes significantly to human AMR via direct contact or consumption of animal products [19,28]. Restricting antimicrobial use in livestock has proven effective, as seen in the European Union, where antibiotics for growth promotion were banned and prophylactic use requires veterinary supervision, reducing AMR in animals and humans [9,29]. In Rwanda, awareness gaps persist; a study in the Eastern Province found that 83.9% of cattle farmers obtained antibiotics from neighbors or friends, and 61.9% used them for growth promotion [30].

Advantages: Proper antimicrobial use in livestock reduces AMR through a One Health approach, improves farmer knowledge, and minimizes economic losses from overuse [20, 31].

Disadvantages: Limited knowledge among animal health professionals could hinder policy enforcement; 67.96% of respondents in five Rwandan districts were unaware of the link between animal and public health [32].

Option 3: *Enforce Prohibition of Over-the-Counter (OTC) Antibiotic Sales*

OTC sales of antibiotics without prescriptions drive misuse and increase AMR [13,33]. Before 2022, Rwanda lacked an explicit policy prohibiting OTC sales, but the Rwanda FDA now enforces regulations with sanctions for violations [23]. Despite regulatory efforts, non-prescribed antibiotic use remains common globally, including in Rwanda, necessitating robust law enforcement and monitoring [24,34].

Advantages: Reducing OTC sales can significantly decrease antibiotic misuse, lowering AMR risk [12].

Disadvantages: Stricter enforcement may increase patient load on healthcare systems and limit access to medicines in rural areas with few healthcare providers [21].

Option 4: *Maintain Status Quo (“Do Nothing”)*

This alternative proposes minimal additional intervention, leaving NAP 2’s activities unenhanced.

Advantages: No additional funding, training, or surveillance is required, minimizing budgetary impact.

Disadvantages: AMR will continue to rise, potentially causing 39.1 million global deaths over the next 25 years and exacerbating poverty in LMICs [35].

Comparing AMR Policy Actions

Policy options were compared across five criteria (equity, sustainability, efficacy, cost-effectiveness, and One Health alignment) based on their advantages, disadvantages, and feasibility.

Table 1 presents a qualitative comparison of four policy alternatives for addressing AMR in Rwanda using five evaluation criteria: equity, sustainability, efficacy, value for money, and holistic approach. The scores reflect the relative strength of each policy option based on these criteria.

Strengthening surveillance systems scored highest in equity and sustainability, as decentralized surveillance allows nationwide monitoring and ensures that both rural and urban populations benefit from early detection of antimicrobial resistance patterns. This option also strongly supports a One Health approach by integrating data from human, animal, and environmental health sectors. Regulating antimicrobial use in livestock showed the highest performance in efficacy and value for money, as reducing antibiotic misuse in food-producing animals addresses one of the major drivers of AMR and has demonstrated effectiveness in several countries, including those within the European Union.

Enforcing the prohibition of over-the-counter antibiotic sales showed moderate benefits across most criteria, particularly in sustainability and efficacy. However, potential equity challenges may arise in rural areas where healthcare access remains limited. In contrast, maintaining the status quo (“do nothing”) option scored lowest across all criteria, as failure to strengthen AMR control strategies would likely allow resistance to continue increasing, resulting in greater health and economic burdens.

Policy Recommendations

Rwanda should prioritize a robust, decentralized AMR surveillance system that integrates human, animal, and environmental health data. This approach enables early detection of resistance, supports evidence-based clinical decisions, and strengthens national reporting to WHO GLASS [27]. Surveillance should extend beyond tertiary hospitals to district hospitals, veterinary laboratories, and environmental sites to improve coverage and inform targeted interventions.

To complement surveillance, antimicrobial use in livestock should be regulated to reduce resistance transmission from animals to humans, and prescription-only antibiotic sales should be strictly enforced to prevent community misuse.
Together, these strategies adopt a One Health approach, recognizing the interconnectedness of human, animal, and environmental health. Implementation requires coordinated collaboration among government agencies, veterinary services, research institutions, and international partners. This combined approach offers Rwanda a sustainable and comprehensive pathway to reduce antimicrobial resistance and protect public health [6].

REFERENCES

[1] World Health Organization, “Antimicrobial Resistance,” 2023. [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance
[2] Murray, C. J., Ikuta, K. S., Sharara, F., Swetschinski, L., Aguilar, G. R., Gray, A., ... & Tasak, N. “Global burden of bacterial antimicrobial

Table 1: *Comparative Assessment of Policy Alternatives for AMR Control in Rwanda*

Policy	Equity	Sustainability	Efficacy	Value for Money	One Health Approach
Do Nothing	+	+	+	+	+
Strengthening Surveillance System	+++	+++	++	+	+++
Reduction of antimicrobial use in Livestock	++	++	+++	+++	++
Stopping Over the counter sales of Antibiotics	+	++	++	++	++

resistance in 2019: a systematic analysis," The Lancet, vol. 399, no. 10325, pp. 629–655, 2022. https://doi.org/10.1016/S0140-6736(21)02724-0

[3] G. Sulis, S. Sayood, and S. Gandra, "Antimicrobial resistance in low- and middle-income countries: current status and future directions," Expert Review of Anti-infective Therapy, vol. 20, no. 2, pp. 147–160, 2022. https://doi.org/10.1080/14787210.2021.1951705

[4] T. Habyarimana, D. Murenzi, E. Musoni, C. Yadufashije, and F. N. Niyonzima, "Bacteriological profile and antimicrobial susceptibility patterns of bloodstream infection at Kigali University Teaching Hospital," Infection and Drug Resistance, vol. 14, pp. 699–707, 2021. https://doi.org/10.2147/IDR.S299520

[5] Sutherland, T., Mpirimbanyi, C., Nziyomaze, E., Niyomugabo, J. P., Niyonsenga, Z., Muvunyi, C. M., ... & Riviello, E. D. "Widespread antimicrobial resistance among bacterial infections in a Rwandan referral hospital," PloS One, vol. 14, no. 8, e0221121, 2019. https://doi.org/10.1371/journal.pone.0221121

[6] O. Bizimungu, P. Crook, J. F. Babane, and L. Bitunguhari, "The prevalence and clinical context of antimicrobial resistance amongst medical inpatients at a referral hospital in Rwanda: A cohort study," Antimicrobial Resistance & Infection Control, vol. 13, no. 1, p. 22, 2024.

[7] Schreidah, C., Giesbrecht, D., Gashema, P., Young, N. W., Munyaneza, T., Muvunyi, C. M., & Karema, C. "Expansion of artemisinin partial resistance mutations and lack of histidine-rich protein-2 and -3 deletions in Plasmodium falciparum infections from Rukara, Rwanda," Malaria Journal, vol. 23, no. 1, p. 150, 2024. https://doi.org/10.1186/s12936-024-04981-4

[8] R. Manishimwe, P. M. Moncada, V. Musanayire, A. Shyaka, H. M. Scott, and G. H. Loneragan, "Antibiotic-resistant Escherichia coli and Salmonella from the feces of food animals in the East Province of Rwanda," Animals, vol. 11, no. 4, p. 1013, 2021. https://doi.org/10.3390/ani11041013

[9] Tang, K. L., Caffrey, N. P., Nóbrega, D. B., Cork, S. C., Ronksley, P. E., Barkema, H. W., ... & Ghali, W. A. "Restricting the use of antibiotics in food-producing animals and its associations with antibiotic resistance in food-producing animals and human beings: a systematic review and meta-analysis," The Lancet Planetary Health, vol. 1, no. 8, pp. e316–e327, 2017. https://www.thelancet.com/journals/lancet/article/PIIS2542-5196(17)30141-9/fulltext

[10] T. K. Burki, "Superbugs: an arms race against bacteria," The Lancet Respiratory Medicine, vol. 6, no. 9, p. 668, 2018. https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(18)30271-6/fulltext

[11] World Bank, Drug-Resistant Infections: A Threat to Our Economic Future, 2017. [Online]. Available: https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf

[12] Jacobs, T. G., Robertson, J., van den Ham, H. A., Iwamoto, K., Bak Pedersen, H., & Mantel-Teeuwisse, A. K. "Assessing the impact of law enforcement to reduce over-the-counter (OTC) sales of antibiotics in low- and middle-income countries; a systematic literature review," BMC Health Services Research, vol. 19, no. 1, p. 536, 2019. https://doi.org/10.1186/s12913-019-4359-8

[13] M. Melles-Brewer, F. Chiara, D. Mosissa, and P. Mathew, "Over-the-counter sales of antibiotics: a call to action to ensure access and prevent excess," The Lancet Global Health, vol. 12, no. 8, pp. e1227–e1228, 2024. https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(24)00215-8/fulltext

[14] Republic of Rwanda, National Action Plan on Antimicrobial Resistance 2020–2024, 2021. [Online]. Available: https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/amr-spc-npm/nap-library/rwanda-nap-amr.pdf?sfvrsn=e292aeb1_5

[15] Republic of Rwanda, National Action Plan on Antimicrobial Resistance 2025–2029, 2025. [Online]. Available: https://rbc.gov.rw/fileadmin/user_upload/strategy/2nd_NATIONAL_ACTION_PLAN_ON_AMR_NAP_2025-2029_.pdf

[16] Institute for Health Metrics and Evaluation (IHME), "The burden of antimicrobial resistance (AMR) in Rwanda," University of Washington, 2022. [Online]. Available: https://www.healthdata.org/sites/default/files/2023-09/Rwanda.pdf

[17] A. C. Seale, N. C. Gordon, J. Islam, S. J. Peacock, and J. A. G. Scott, "AMR surveillance in low and middle-income settings - A roadmap for participation in the Global Antimicrobial Surveillance System (GLASS)," Wellcome Open Research, vol. 2, 92, 2017. https://doi.org/10.12688/wellcomeopenres.12527.1

[18] P. Ondoa, G. Kapoor, Y. Alimi, E. Shumba,

G. Osena, M. Maina, et al., “Bacteriology testing and antimicrobial resistance detection capacity of national tiered laboratory networks in sub-Saharan Africa: An analysis from 14 countries,” The Lancet Microbe, vol. 6, no. 1, 2025. https://doi.org/10.1016/j.lanmic.2024.100976

[19] M. Z. Hosain, S. L. Kabir, and M. M. Kamal, “Antimicrobial uses for livestock production in developing countries,” Veterinary World, vol. 14, no. 1, pp. 210, 2021. https://pmc.ncbi.nlm.nih.gov/articles/PMC7896880/

[20] F. Baudoin, H. Hogeveen, and E. Wauters, “Reducing antimicrobial use and dependence in livestock production systems: A social and economic sciences perspective on an interdisciplinary approach,” Frontiers in Veterinary Science, vol. 8, p. 584593, 2021. https://doi.org/10.3389/fvets.2021.584593

[21] S. K. Ahmed, S. Hussein, K. Qurbani, R. H. Ibrahim, A. Fareeq, K. A. Mahmood, and M. G. Mohamed, “Antimicrobial resistance: Impacts, challenges, and future prospects,” Journal of Medicine, Surgery, and Public Health, vol. 2, p. 100081, 2024. https://doi.org/10.1016/j.glmedi.2024.100081

[22] A. M. Durbeej-Hjalt, “Retail pharmacy market in Kigali - A game theoretical application on antimicrobial resistance,” 2022. https://lup.lub.lu.se/student-papers/search/publication/9083536

[23] Rwanda Food and Drugs Authority, “Prohibition of Dispensing Specified Medicines without Medical Prescriptions,” 2024. [Online]. Available: https://rwandafda.gov.rw/wp-content/uploads/2024/12/Prohibition-of-dispensing-specified-medicines-without-medical-prescription.pdf

[24] M. L. Moura, I. Boszczowski, M. Blaque, R. M. Mussarelli, V. Fossaluza, L. C. Pierrotti, et al., “Effect on antimicrobial resistance of a policy restricting over-the-counter antimicrobial sales in a large metropolitan area, São Paulo, Brazil,” Emerging Infectious Diseases, vol. 28, no. 1, pp. 180–187, 2022. https://doi.org/10.3201/eid2801.201928

[25] World Health Organization, “68th World Health Assembly Resolution on Antimicrobial Resistance,” Geneva, Switzerland, 2015. [Online]. Available: https://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R9-en.pdf

[26] N. Rijal, J. Acharya, S. Adhikari, B. P. Upadhaya, G. Shakya, P. Kansakar, and P. Rajbhandari, "Changing epidemiology and antimicrobial resistance in Vibrio cholerae: AMR surveillance findings (2006–2016) from Nepal," BMC Infectious Diseases, vol. 19, pp. 1–8, 2019. https://link.springer.com/article/10.1186/s12879-019-4432-2

[27] World Health Organization, "Global Antimicrobial Resistance and Use Surveillance System (GLASS)," [Online]. Available: https://www.who.int/initiatives/glass

[28] F. Ma, S. Xu, Z. Tang, Z. Li, and L. Zhang, "Use of antimicrobials in food animals and impact of transmission of antimicrobial resistance on humans," Biosafety and Health, vol. 3, no. 1, pp. 32–38, 2021. https://doi.org/10.1016/j.bsheal.2020.09.004

[29]. S. Zheng, Y. Li, C. Chen, N. Wang, and F. Yang, "Solutions to the Dilemma of Antibiotics Use in Livestock and Poultry Farming: Regulation Policy and Alternatives," Toxics, vol. 13, no. 5, p. 348, 2025. https://doi.org/10.3390/toxics13050348

[30] E. M. Hirwa, G. Mujawamariya, N. Shimelash, and A. Shyaka, "Evaluation of cattle farmers' knowledge, attitudes, and practices regarding antimicrobial use and antimicrobial resistance in Rwanda," PloS One, vol. 19, no. 4, p. e0300742, 2024. https://doi.org/10.1371/journal.pone.0300742

[31] B. Iraguha, J. P. M. Mpatswenumugabo, M. N. Gasana, and E. Åsbjer, "Mitigating antibiotic misuse in dairy farming systems and milk value chain market: Insights into practices, factors, and farmers education in Nyabihu district, Rwanda," One Health, vol. 19, p. 100843, 2024. https://doi.org/10.1016/j.onehlt.2024.100843

[32] D. Mugwaneza, E. Rwagasore, Z. El-Khatib, P. Dukuziyaturemye, J. Omolo, O. Nsekuye, S. Rwunganira, and M. Manzi, "Factors Associated with Inappropriate Use of Antibiotics Among Animal Health Professionals in Selected Districts of Rwanda, 2021," Journal of Epidemiology and Global Health, vol. 14, no. 2, pp. 265–273, 2024. https://doi.org/10.1007/s44197-024-00192-x

[33] N. T. Do, H. T. Vu, C. T. Nguyen, S. Punpuing, W. A. Khan, M. Gyapong, et al., "Community-based antibiotic access and use in six low-income and middle-income countries: a mixed-method approach," The Lancet Global Health, vol. 9, no. 5, pp. e610–e619, 2021. https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(21)00024-3/fulltext

[34] C. Llor, R. Benkő, and L. Bjerrum, "Global restriction of the over-the-counter sale of

antimicrobials: does it make sense?," Frontiers in Public Health, vol. 12, p. 1412644, 2024. https://www.frontiersin.org/journals/publichealth/articles/10.3389/fpubh.2024.1412644/full

[35] M. Naghavi, S. E. Vollset, K. S. Ikuta, L. R. Swetschinski, A. P. Gray, E. E. Wool, et al., "Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050," The Lancet, vol. 404, no. 10459, pp. 1199–1226, 2024. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)01867-1/fulltext?hidemenu=true

Rwanda
Public Health Bulletin

About the Rwanda Public Health Bulletin (RPHB)

The Rwanda Public Health Bulletin (RPHB) is a printed and open access, peer-reviewed journal, published as the flagship scientific and technical periodical publication. RPHB is a public health bulletin launched in March 2019 by the Rwandan Ministry of Health, through the Rwanda Biomedical Centre (RBC) in collaboration with the CDC Foundation and with support from Bloomberg Philanthropies Data for Health Initiative.

Mission

To serve as a scientific information dissemination platform of national and international significance, mainly in areas related to the Rwanda Ministry of Health's essential mission to strengthen national and local health systems and improve the health of the people of Rwanda. The Rwanda Public Health Bulletin publishes disease surveillance summaries, public health response guidelines, public health notices, case reports, outbreak reports, original research papers, and policy briefs among others. It generally features issues of importance to its targeted audience, which is health professionals, academic researchers, policymakers and anybody interested in health issues. Articles for publication are received from doctors, nurses, allied health professionals, students, policymakers, government bodies, non-governmental bodies and others.

Aim

To bridge the gap in public health information sharing between policymakers, researchers, health professionals and practitioners.

Publisher

RPHB is a publication of the Rwanda Health Communication Centre (RHCC) which is the communication arm of the Rwanda Ministry of Health and operating under the Rwanda Biomedical Centre (RBC).

Registration

Online ISSN: 2663 - 4651, Print ISSN: 2663 - 4643

Rwanda
Public Health Bulletin

INSTRUCTIONS TO AUTHORS

All works submitted to this bulletin will have to belong to the types of articles stated below:

1. ORIGINAL RESEARCH

Referred to as “Primary Research” pioneer in a determined domain. It can be from various aspects: Clinical features, pathophysiology, biochemistry, molecular biology, etc.

THE TITLE

The title of the article should be concise and informative. It should contain enough thoughts on the subject.

ABSTRACT

Abstract of 250 words maximum must accompany each manuscript and be divided into 4 paragraphs with the following headings and MeSH keywords:

Introduction: stating the purposes/aims of the work; the research undertaken, the hypothesis tested or the procedure evaluated.
Materials and methods: briefly stating what was done and what materials were used, including the number of subjects, the methods to assess the data and to control bias.
Results: Providing key findings of the study, including indicators of statistical significance, actual numbers, as well as percentages.
Conclusion: Summarizing in 1 or 2 sentences the work on the basis of the findings. It emphasizes new and important aspects of the study or observations.

THE MAIN TEXT

The text of observational and experimental articles is divided into sections with the following headings: Introduction: should always begin the text, and requires brevity and focuses. It conveys the nature and purpose of the work, and quotes the relevant literature. Only strictly pertinent background information is necessary for understanding why the topic is important. We suggest the final paragraph clearly states the hypothesis or purpose of the study.

METHODS

Details of clinical and technical procedures should follow the introduction. A clear description of the selection of the observational or experimental subjects should be given. The identification of all aspects of the study, its reasoning, and the related relevance should be explicitly justified. In case, the study was done in a particular way, the guiding principles should all be clarified. Exclusion and inclusion criteria or partial inclusion, the reliability index, the confidentiality index, the analysis step, and the data collection processes should be also carefully specified. This section should provide sufficient details on the methods, instrumentation, procedures, all drugs and chemicals used (including generic names, doses, routes of administration). It should allow other workers to reproduce the study if necessary.
This section should also state the self-evaluation of the study by: independent/consensus readings blinded or unblinded to other information and estimate the fluctuation of recall biases by random ordering of studies.

Be clear about the retrospective or prospective nature of the study. Finally, provide references to established methods, including statistical methods that have been published, forthcoming, or that may not be well known. New description or substantially modified methods may be used however, give reasons for the use of these techniques, and evaluate their limitations. Statistical methods should be described with enough details to enable a knowledgeable reader with access to the original data to verify the reported results. A general description of methods would be defined in the methods section, whereas a specific statistical method used into analysis would be summarized in the results section. Any general use of the computer program should be specified, and more details have to be clarified about any randomization issues.

RESULTS

Logical sequence of presentation of results is required in the text; along with tables, and illustrations. Repetition of data from illustrations into the text should be avoided; however, emphasize or summary of only important observations would be helpful. Avoid the ‘’non-technical use’’ of technical terms in statistics which should be defined and reserved for the right purpose. Moreover, define all those statistical terms aside with or including abbreviations and/or most used symbols. Any complication and/or unexpected finding should be reported and the more possibly explained and the author should report lost to follow up and dropouts from a clinical trial.

DISCUSSION

Use ample subheadings. Emphasize the new and important aspects of the study and the conclusions that follow from them. Avoid repetition of details included in other parts. This section requires the mention of the implication of the findings, and their limitations for future research, involving relating the observations to other relevant studies.

Finally, the conclusions should be linked to the goals of the study; though mostly avoiding:

Unqualified statement not completely supported by the data

Statement on economic benefits and costs unless the report includes economic data and analyses

Claim of priority and alluding to work that has not been completed.

Whereas new hypotheses could be suggested when warranted, but they should be clearly labeled as such and recommendations, when appropriate and needed, may be given.

Acknowledgments

List all contributors who do not meet the criteria of authorship, such as those who provided purely technical help, writing assistance, or a department chair who provided only general support; and their respective contribution will be headed as provided. Everybody must have given written permission to be acknowledged. References: References should be numbered consecutively in the order in which they were first mentioned in the text. They will be identified in the text, tables, and legends by arabic numbers. This bulletin uses the IEEE style (Institute of Electrical and Electronics Engineers) for referencing the citations. It is advised to avoid citations or personal communication unless they provide essential and pertinent information. In all case, the name of the person and date of communication should be cited in parentheses in the text.

2. CHECKLIST FOR SURVEILLANCE REPORTS

Disease surveillance summaries are reported following the checklist below:
Title: Compose a title that includes the name of the health condition, population, time and place.
Abstract: Provide a structured abstract including the following sub- headings: Background; Objectives; Methods; Results; and Conclusion.

INTRODUCTION

Context: Summarize the current situation regarding the health condition under surveillance and identify why it is important. Objectives: State the objective of the surveillance report.

METHODS

Setting: Describe the setting, locations and dates of the surveillance period.
Population: Describe the population under surveillance. Definitions: Provide definitions for each health event under surveillance, including

case definitions and any public health interventions. **Information sources**: Describe all data sources, including the objective of any surveillance systems, what data were collected and how data were gathered, transferred and stored. Supplementary data: If appropriate, note where to access supplemental material (e.g., www.opendata.gc.ca). **Data quality, missing data and reporting delays:** Describe how the data quality was assessed. Explain how missing data were addressed. If data is reported by date of diagnosis or symptom onset, include a statement about whether the data for the most recent periods may be revised.

DATA ANALYSIS

Describe any analytical methods used providing sufficient detail to enable a knowledgeable reader with access to the original data to judge its appropriateness and to assess the reported results.

RESULTS

Descriptive: Provide a summary of the descriptive data, including demographics.
Data Quality: Report on data quality (e.g., completeness, missing data, under reporting)
Analytic data: Provide a summary of the analysis including (when indicated) estimates of trends. When applicable, point estimates should include appropriate indicators of measurement error such as 95% confidence intervals (e.g., average annual percentage change used to describe trends or odds ratios used to describe subgroup differences).
Figures: Create the minimum number of figures to highlight key results. Create a title that includes person, time and place.

DISCUSSION

Key results: Summarize key results with reference to study objectives
Comparison: Consider these findings in relation to the current literature. Strengths and weaknesses: Discuss the strengths and weaknesses of the study (data quality, completeness, sources of potential bias). Interpretation and generalizability: Provide a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies and other relevant evidence.
Conclusion: Ensure conclusions address objectives and follow from the results.

3. PUBLIC HEALTH NOTICES / OUTBREAK REPORTS

Following the Center for Disease Control recommendations, for public heath notices and outbreak reports to be published they need to cover all four components as stated below:

INTRODUCTION

Generally, the introductory paragraph should begin with 1 to 3 sentences establishing the existence of the outbreak or underlying public health problem. E.g., “On January 2, 2008, the Nevada State Health Division contacted CDC concerning surveillance reports received regarding two persons recently diagnosed with acute hepatitis C.” The introductory paragraph also usually contains: a) a statement that an investigation was conducted, when and by whom; b) the most important finding(s); c) the actions taken to stem the outbreak; and d) a statement of the public health implications and actions that should be taken in response to the investigation. Investigation and results: First, present the initial investigation and its findings. This might include: 1) a description of the setting and a statement of how the outbreak came to the attention of health authorities; 2) a clinical description of the index case or initial cases; 3) initial key test results; and 4) hypothesis generation activities and results. Next, summarize the full investigation, including: case definition, case-finding activities, method of investigation, and results. Cases should be counted and described by clinical characteristics, treatment, and outcome, as well as time, place, and person descriptive results. Next, present the methods and results of any analytic epidemiologic studies (e.g., cohort or case-control studies). Finally, provide the results of any relevant microbiologic, genetic, or toxicologic results, followed by the results of any testing of environmental samples. Public health response: When appropriate, a brief description summarizing any public health interventions taken and the results of the interventions follows.

DISCUSSION

Same as for a Full Report, except that a Limitations paragraph might not be required for an Outbreak Report.

4. POLICY BRIEFS

This bulletin will use guidelines on reporting/publishing policy notes as they are suggested by the Center for Disease Control (CDC). As the CDC defines them; Policy Notes are intended to announce new official policies or recommendations (e.g., from ACIP or CDC). These reports can be thought of as briefs. Maximum word count at submission is 1,400 words. Up to three tables, figures, or boxes may be included. Policy Notes contain no Discussion or Limitations, and a summary box is not required. Although policy notes or brief might vary, following is a rough guide of what basic notes should have: Introduction: The introductory paragraph should be limited to 150–200 words. It might contain all or some of the following components: a brief introductory statement orienting the reader to the topic and placing it in context, a brief description of the public health problem, a brief statement of the rationale for the policy or recommendation, mention of the most important parts of the policy or recommendations, and one or two sentences stating the conclusions and the public health implications of the new policy or recommendations.

BACKGROUND

The Policy Note should include a paragraph after the introduction that summarizes background information relevant to the policy or recommendation that can help the reader understand the context and need for the policy or recommendation.

Methods: Should include a summary of the methods used to establish the policy or recommendation, including answers to some or all of these questions: Who was involved in the production of the guidelines or recommendations, and how? What evidence base was considered? What was the rationale for considering this evidence base? Was other evidence excluded from consideration and, if so, why? Rationale and evidence: The Policy Note should provide a concise review of the rationale for the policy or recommendation and a descriptive review of the scientific evidence used to establish it. It should include an explanation of how the policy or recommendation adds to, or differs from, relevant policies or recommendations established previously. Presentation of the policy or recommendation: The policy or recommendation should state clearly when it takes effect and to whom and under what circumstances it applies.

DISCUSSION OR COMMENT

The Policy Note should comment on the likely impact of the new policy or recommendation and plans for assessment of the policy or recommendation

5. CASE REPORTS

These are reports of an individual patient on their symptoms, treatment reactions on a disease or condition of interest. These reports normally focus on unusual reactions or occurrences. Similar cases to other research reports, case reports might include a literature review of previous similar. Case reports might also address positive patient outcome on particular treatment guidelines or individual impact of a particular intervention. These are mainly used for educational and decision-making purposes. Case reports are normally reported following a checklist found at the CARE Guidelines.

6. CASE STUDIES

We recommend authors to follow the “EQUATOR Network” for ample explanations and guidelines in the writing of such articles. They have to be well-described case studies on health care interventions of public health concern. These could be:

Rigorous assessments of processes and program interventions.

Recommendations on possible health interventions.

Never on individual patient (= case report)

7. COMMENTARIES / OPINION / METHODOLOGY ARTICLES

We recommend authors to follow the “EQUATOR Network” for ample explanations and guidelines in the writing of such articles. Though these articles are moderated, they should be:

Short, focused, opinionated to previous articles or any subject related to the journal entirely.
Contemporary and focusing on specific issues.
Normally up to 800 words.

Frank critics to the journal are bravely motivated and would be as much as possible published.

8. FORMATTING THE MANUSCRIPT

Please note that articles which are not correctly formatted will be returned to the authors

Format text: Style: No Spacing, Single column, Single Spacing
Font: Single Spacing, Times New Roman - size 12
Titles: Capitals and bold, size 14
Format tables: Times New Roman, Font size 9 No vertical lines. Horizontal lines in the table can be removed. No table should be larger than a single A4 page. Footnote should be size 9 and italic

Rwanda
Public Health Bulletin

Publisher

Rwanda Health Communication Centre.

Email: rwandapublichealthbulletin@gmail.com

Disclaimer

Acknowledgement

This publication of Rwanda Public Health Bulletin (RPHB) was made possible by financial support from the Bloomberg Philanthropies Data for Health Initiative through the CDC Foundation. Its contents are solely the responsibility of the authors and don't necessarily represent the official views of Bloomberg Philanthropies, the CDC Foundation or the U.S. Centers for Disease Control and Prevention.

© March 2026