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

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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.

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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

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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.

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