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Community-Based Health Insurance as a Determinant of Maternal Health Outcomes: Evidence from a Retrospective Cohort Study in Rwanda

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Abstract: **Community-Based Health Insurance (CBHI) has become one of the most important health financing reforms for improving healthcare access in low- and middle-income countries. Rwanda's Community-Based Health Insurance scheme, locally known as Mutuelles de Santé, has contributed significantly to the achievement of universal health coverage and improved healthcare utilization. However, the empirical data on how CBHI affects maternal health services utilization and maternal and neonatal outcomes is still limited. This study assessed the influence of CBHI on maternal healthcare services utilization and maternal and neonatal outcomes at Kibungo Level Two Teaching Hospital in Rwanda. The study used quantitative method design. A retrospective cohort approach was employed involving 375 well completed maternity records from 2023 to 2025 that were purposively selected. Data were entered into Microsoft excel, coded and cleaned, analyzed using SPSS version 26 through descriptive statistics, chi-square tests, and logistic regression analysis. Findings showed that 91.2% of women were enrolled in CBHI, while 16.3% possessed supplementary insurance schemes such as RAMA, MMI, Sanlam, and Old Mutual. Women enrolled in CBHI demonstrated significantly higher utilization of antenatal care 84.2% compared to 39.4% for uninsured, skilled birth attendance 96.8 vs 72.7%, and postnatal care services 88.6% vs 45.5% of uninsured women. Maternal complications and neonatal admissions were significantly lower among insured women. Logistic regression analysis indicated that insured women were 8.20 times more likely to experience favorable maternal and neonatal outcomes than uninsured women *(OR = 8.20, p < 0.001)*, where insured women 93.3% had no maternal complications compared to 69.7% of uninsured, and neonates with ≥7 Apgar score 95.0% vs 70%. The study concludes that CBHI significantly influence maternal healthcare utilization and improves maternal and neonatal outcomes in Rwanda.**

Keywords: **Community-Based Health Insurance, maternal healthcare, maternal outcomes, neonatal outcomes, Rwanda.**

1. INTRODUCTION

1.1 Introduction

Community-Based Health Insurance (CBHI) has emerged as an important strategy for improving healthcare access among low-income populations. Rwanda introduced CBHI to reduce out-of-pocket healthcare expenditure and improve healthcare accessibility. (Musange et al., 2016) The implementation of CBHI has contributed significantly to Rwanda's progress toward universal health coverage. (RSSB, 2023)

Despite the success of CBHI, evidence on its direct influence on maternal healthcare utilization and maternal and neonatal outcomes at facility level remains limited. This study therefore examined the influence of CBHI on maternal healthcare service utilization and outcomes at Kibungo Level Two Teaching Hospital.

1.2 Problem statement

Even with national efforts to enhance healthcare accessibility and reduce maternal mortality rates, indicators of maternal healthcare, such as prenatal care coverage, skilled birth attendance, and the use of postnatal care, remain low, especially among women in rural areas and those with low incomes. This is despite the implementation of community-based health insurance (CBHI), which provides financial security and healthcare access to a large number of people.

Moreover, despite CBHI's contribution to access to healthcare services for its members, empirical research on how it affects maternal and neonatal healthcare utilization and maternal health outcomes is limited, because even the researchers who attempted such as the research of Andinet, Daniel, and Abebe (2019) focused on the impacts of CBHI on healthcare spending in general, the research of Nyandekwe, Nzayirambaho, and Kakoma (2020) focused on challenges and solutions on financial sustainability of CBHI, whereas the research of Rachel K, et al.(2022) focused on financial catastrophe after cesarean.

It was in this regard, a researcher wanted to conduct a localized hospital- based study analyzing the impacts of CBHI on maternal healthcare services utilization, and maternal health outcomes at Kibungo L2TH. It is anticipated that the results will influence interventions and health policy in order to guarantee that CBHI effectively improves maternal health outcomes.

1.3 Research Objectives

1.3.1 General Objectives

The general objective of this study is to assess the impact of community-based health insurance (CBHI) on maternal healthcare services in Rwanda, a case of Kibungo Level Two Teaching Hospital.

1.3.2 Specific Objectives

The specific objectives of the study are:

i. To analyze the enrollment rate of pregnant women in the Community- Based Health Insurance scheme at Kibungo Level Two Teaching Hospital.

ii. To evaluate maternity service utilization by pregnant women insured in CBHI compared to uninsured women.

iii. To examine maternal health outcomes (maternal morbidity, mortality and birth outcome) of insured women compared to uninsured.

1.4 Research Questions

(i) What is the enrollment rate of pregnant women in the Community- Based Health Insurance scheme at Kibungo L2TH?

(ii) How often do pregnant women ensured in CBHI utilize maternal healthcare services compared to uninsured women?

(iii) To what extent does CBHI influence maternal health outcomes of insured women compared to uninsured.

1.5 Significance of the Study

This study is really essential. First and foremost, it provides important information regarding how community-based health insurance (CBHI) affects the utilization of healthcare services for mothers, particularly in Rwanda, where improving maternal health outcomes remains a high priority.

Second, the research findings will assist development partners, legislators, and healthcare planners. This can direct initiatives to improve CBHI schemes' planning, execution, and sustainability in order to guarantee that they successfully lower financial barriers, raise the caliber of services, and support fair access to care for all women.

Finally, the study also contributes to the body of knowledge that exist on maternal health and health financing, establishing the framework for future research. Future research on how insurance models might be improved to enhance health outcomes particularly for vulnerable populations may be motivated by this.

1.6 Limitation and Delimitation of the Study

1.6.1 Limitations of the Study

This study, while important, faced a number of limitations that could have influenced the comprehensiveness and depth of its findings. A significant constraint was time. The research needed to be carried out within a constrained academic calendar,

which limited the researcher's ability to conduct longitudinal data collection or broaden the study to include multiple healthcare facilities for comparison.

This study encountered limited budget that could have impacted the depth of the research. According to Mbau et al. (2020), in low-resource contexts, financial limitations significantly influence the extent and impact of health systems research.

Finally, while some hospital records and CBHI administrative data were necessary for a more in-depth analysis, certain files could not be accessed due to confidentiality policies and data protection protocols. This limited the primary and secondary data triangulation, which is critical for ensuring the validity of research.

1.6.2 Delimitations of the Study

The study was intentionally narrowed down in several aspects to handle these limitations and guarantee feasibility. The study was geographically limited to Kibungo Level Two Teaching Hospital, which is a teaching and referral hospital situated in Ngoma District in Rwanda's Eastern Province. The site was selected for its relevance to the CBHI scheme, as it serves a large population and has an organized maternal care system.

The study focused on women who delivered at KL2TH facility for the last two years (2023-2024 & 2024-2025) examining 375 complete maternity record files. It also focused on three key aspects of maternal health care: prenatal care (ANC), delivery services, and postnatal care. These components are critical to the maternal health continuum and are identified as priority indicators in international monitoring frameworks established by the World Health Organization (WHO) and UNICEF (2023). Other healthcare services, such as pediatric care, chronic illness management, and emergency surgery, were excluded from the study because they were not relevant to maternal health care or the study's aims.

These delimitations were crucial for preserving the clarity, focus, and feasibility of the study. They allowed the researcher to operate within academic and logistical limitations while still generating results that are valid, context-specific, and useful for shaping future policy and practice in Rwanda's maternal health care system.

2. LITERATURE REVIEW

2.0 Introduction

While the empirical literature focused on reviewing prior research on the study's specific objectives, critical review and research gap identification focused on critiquing prior research on the study's specific objectives and identifying the gaps that earlier researchers in this field had overlooked, the conceptual framework dealt with illustrating the relationship between Community-Based Health Insurance(CBHI) and Maternal Healthcare outcomes(MHO), while the theoretical framework covered the theories that direct this investigation.

2.1 Theoretical Literature Review

The study's foundation is provided by a theoretical review. It identifies the main ideas that explain how community-based health insurance (CBHI) and the use of maternal health care services are related.

2.1.1 Community- Based Health Insurance (CBHI) scheme

CBHI is referred to as a solidarity health insurance system in which individuals who need medical treatment and protection from financial catastrophic expenditures come together and pay their contributions. The World Health Organization defines Universal Health Coverage (UHC) as ensuring that all individuals have access to a comprehensive array of high-quality healthcare services whenever they require them, without experiencing financial difficulties.

Community-based health insurance (CBHI) has emerged as a viable strategy for increasing access to healthcare, particularly in low- and middle-income nations. CBHI schemes are voluntary, non-profit insurance programs that are managed and owned by the community they serve. These schemes aim to pool health risks and resources within a community, providing members with financial protection against the costs of healthcare.

The theoretical foundations of CBHI draw from various disciplines, including social capital theory, The CBHI scheme was officially introduced in Rwanda in 2005 as part of the country's broader health sector reform to improve healthcare access for its population, particularly in rural and underserved areas, with the primary goal of providing financial protection against the cost of medical care, lowering out-of-pocket expenses, and improving Rwandans' access to essential healthcare services. (Lenhardt, sdg16.plus, 2023)

The CBHI system is governed by the Law No. 62/2007 of December 30, 2007, which was published in the official gazette on March 20, 2008. (Health; 2010) CBHI is managed at the community level, with local health committees overseeing its administration whereas district manages its own CBHI fund, with support from the national government.

The membership is typically organized at the cell or sector level, with local leaders and health workers facilitating enrollment and contributions. CBHI scheme offers coverage for a wide range of health services, including outpatient treatment, inpatient care, maternity and child health services, and critical drugs.

It aims to cover most basic and emergency health services. The scheme is designed to be affordable, with low annual premiums. As of today, the member premium is 3000 RWF and the CBHI beneficiaries pay their premiums through irembo.gov.rw. Each member pays a co- payment of 200 RWF at primary healthcare facilities or 10% of cost for higher levels of care including district, provincial, or referral hospitals, except the most vulnerable people who are fully sponsored by the government.

Members typically pay a co-payment or small fee when accessing healthcare services. The cost-sharing structure helps to cover part of the service cost while maintaining the scheme's sustainability and in the year 2023, 91% of the populations were enrolled into CBHI scheme from 75% in 2016. (RSSB, 2023)

2.1.2 Maternal Healthcare Services

The WHO explains maternal health as women's overall well-being throughout pregnancy, childbirth, and postpartum. Providing a positive experience at each stage can help moms and infants attain optimal health and well-being. In 2020, despite significant progress, approximately 287,000 women lost their lives during and following pregnancy and childbirth, highlighting the importance of ongoing maternal health efforts.

Maternal healthcare services encompass routine prenatal visits, offering health education and preparing expectant mothers for childbirth. They also include support during delivery by skilled healthcare professionals to handle any complications and ensure a safe birth. It also includes care given to the mother and newborn after delivery to monitor recovery and address any health issues, and services that enable women to plan and space pregnancies, contributing to better health outcomes of mother and child. (Twagirumukiza et al., 2024)

Rwanda's current ANC utilization lags far below worldwide norms, since WHO increased the necessary number of ANC visits from four to at least eight encounters in 2016. Rwanda offers a universal, community-based health insurance program that involves a household membership and co-payments at the time of service, in which all inhabitants are eligible to join.

2.1.3 Community Based Health Insurance Enrollment Rates

While CBHI is a voluntary, community-driven health financing model intended to provide financial protection against health-related expenses, particularly in low- and average income nations, the scheme's enrollment rate is an important indicator of its reach and effectiveness.

The CBHI enrollment rate is the proportion of eligible households or people who have enrolled for a CBHI scheme during a given time period, and it is usually reported as a percentage.

$$CBHI\ Enrollment = \frac{\text{Number of enrolled households or individuals}}{Total\ eligible\ households\ or\ individuals} \times 100$$

This metric serves as a gauge for the scheme's coverage and the community's acceptance and trust in the insurance model.

A study conducted by Debessa, Negeri, and Dangisso (2024) enrollment rate of women in CBHI insurance and its determinants in Ethiopia, in the Sidama National Regional State, found that 34.9% of women were enrolled in the CBHI scheme and factors such as elderly age, a big number of household members, and moderate wealth index were positively associated with enrollment.

In the Somali Region, households with higher income, membership in solidarity groups, and awareness about CBHI were more likely to enroll and high-income households were approximately four times more likely to have CBHI unlike low-income households.

In Rwanda, a study reported an enrollment rate of 77.2%, highlighting the country's success in implementing CBHI schemes and factors contributing to this high enrollment included strong government support, community engagement, and effective awareness campaigns.

According to Kebebe's research "Exploring Factors Influencing Family's Enrollment in Community-Based Health Insurance", higher income and wealth levels are positively correlated with CBHI enrollment, as they enhance affordability and reduce financial barriers, understanding the benefits and functioning of CBHI schemes increases the likelihood of enrollment, while community education, information dissemination, and involvement in community groups and leadership roles can facilitate enrollment by promoting trust and disseminating information.

Moreover, proximity to health facilities and ease of access to enrollment centers influence participation rates, and confidence in the quality of services provided under the CBHI scheme can encourage enrollment. (Kebebe, 2024)

The CBHI enrollment rate is a vital metric for the examination of community-based health insurance scheme's success. Understanding the factors that influence enrollment can inform strategies to enhance participation and achieve broader health coverage.

2.1.4 Maternal Healthcare Services Utilization

Generally, maternal healthcare is defined as the treatment of women throughout pregnancy, childbirth, and the postpartum phase. Maternal healthcare services utilization is also defined as the extent to which pregnant women access and use healthcare services within the pregnancy, childbirth, and the postpartum period. This usage is a significant predictor of maternal and newborn health outcomes, impacting the prevention and management of problems and contributing to the lowering of maternal death rates. (Shanto et al., 2023)

Health Belief Model (HBM) has been one of the most public health's theories that has been widely used until today. It proposes that individual's sensitivities about their vulnerability to disease, the severity of the illness, the benefits of action, and the barriers to acting all have an influence on their decisions to seek healthcare services.

This model shows how, in the context of CBHI, insured women are more likely to seek maternal health care if they feel it will benefit them, especially when insurance coverage eliminates financial obstacles.

A pregnant woman who views her risk of pregnancy-related complications as high (susceptibility) and perceives those complications as potentially severe (severity) is more inclined to seek care particularly if she thinks that modern healthcare services can mitigate this risk (benefits) and that cost is manageable thanks to insurance coverage. CBHI mitigates perceived financial barriers and serves as a powerful cue to action, facilitating positive maternal health-seeking behaviors.

Maternal healthcare services utilization encompasses a range of services that women may access during the maternal period, including: Antenatal Care (Regular check-ups during pregnancy to monitor the health of the mother and fetus), Skilled Birth Attendance (Assistance during childbirth by trained health professionals to manage complications and ensure safe delivery), and Postnatal Care

Another significant paradigm is the Socio-Ecological Model, which highlights the interaction of individual, interpersonal, communal, and societal-level influences in determining health behaviors, such as maternal healthcare service consumption.

Numerous studies have examined the factors that influence maternal healthcare services utilization. Some of the key factors include: socio- demographic factors, availability& accessibility to healthcare facilities, cultural and social norms, knowledge and awareness, financial and insurance factors, and quality of care.

Women's knowledge and awareness of the value of maternal healthcare services, as well as their comprehension of pregnancy-related issues, might influence their use of these services (Tekelab et al., 2019; Tsegay et al., 2013). The affordability of healthcare services, the availability of health insurance coverage, and the out-of-pocket costs associated with maternal healthcare all have a substantial influence on use (Ensor & Cooper, 2004; Gabrysch & Campbell, 2009).

Women's propensity to seek and use maternal healthcare services can be influenced by their perception of the quality of healthcare services, as well as the attitudes and actions of healthcare professionals.

2.1.5 Maternal Health Outcomes

The WHO describes maternal healthcare outcomes as women's health and well-being during pregnancy, delivery, and the postnatal period, reflecting the efficacy and quality of treatment received at each stage. The WHO also explains maternal health as women's health during these important stages, emphasizing the need of making each step a good experience in order to achieve beneficial results.

The literature conceptualizes maternal healthcare outcomes through various dimensions, including clinical indicators such as maternal morbidity and mortality, as well as patient-reported measures like satisfaction and perceived quality of care. (Beyene et al., 2021)

Severe maternal outcomes (SMO), for example, refer to cases where women nearly die but survive complications related to pregnancy or childbirth, serving as critical clinical markers of healthcare quality. Studies also highlight demographic factors influencing outcomes, such as increased severe maternal morbidity among older women and risks faced by adolescents under 18 years. (NCBI, 2022)

Maternal healthcare utilization is widely used as an outcome measure, with indicators such as at least four antenatal care (ANC) visits, skilled birth attendance (SBA) during delivery, and postnatal care (PNC) within 42 days of birth. Women who meet these criteria are deemed to have used maternal healthcare services effectively, which is linked to better health outcomes. (Hasan et al,2023)

Recent worldwide investigations have shown that maternal health outcomes are influenced by a complex interaction of distal (socioeconomic, environmental) and proximal (healthcare access, quality of treatment) variables. (Souza et al., 2024).

Worldwide, nearly all neonatal fatalities (75%) take place during the initial week of life. Most maternal and newborn deaths happen in low and middle-income countries (LMICs), with Sub-Saharan Africa (SSA) experiencing the highest burden and the lowest availability of comprehensive maternity care. Furthermore, low and middle-income countries account for 98% of the global stillbirth burden, with 75% occurring in SSA and South Asia. (Sserwanja, et al., 2022)

Rwanda has seen remarkable improvements in mother and child survival. The Rwanda Biomedical Report for July 2013–June 2018 states that the nation's under-five mortality rate dropped from 152 fatalities per 1,000 live births to 76, a substantial 50% decrease. The strategic approach of Rwanda to Maternal and Child Health (MCH) is reflected by these successes.

As reported by the National Institute of Statistics of Rwanda (NISR, 2024), there has been a notable reduction in maternal mortality, which has decreased from 1,071 deaths per 100,000 live births in 2000 to 203 per 100,000 in 2023. Additionally, both infant and under-five mortality rates have seen significant declines; specifically, infant mortality has dropped from 107 per 1,000 live births in 2000 to merely 33 in 2023, and under-five mortality has decreased from 196 to 45 per 1,000. The 2020 Rwanda Demographic and Health Survey (RDHS) indicates disparities in maternity care use, with just 47% of women obtaining at least four ANC consultations, compared to 94% for skilled birth attendance.

The Sustainable Development Goals (SDGs), notably SDG Target 3.1, seek to dramatically reduce maternal death rates by enhancing maternity healthcare quality and outcomes globally. (Brown, Boateng, Williamson, and Haygood, 2021) Patient-reported measures of maternal care quality, including perceived care and satisfaction, are critical for monitoring progress toward these goals because they influence care-seeking behaviors and utilization of life-saving services. (Brown et al., 2021)

Maternal healthcare outcomes are multifaceted, encompassing clinical results such as morbidity and mortality, utilization of essential maternal services, and patient-reported experiences like satisfaction and perceived quality. These outcomes are influenced by healthcare system factors, demographic characteristics, and broader social determinants, all of which must be addressed to improve maternal health.

2.2 Empirical Literature Review

2.2.1 Community Based Health Insurance Enrollment Rate and Maternal Health Services

Recent empirical studies indicate varied enrollment rates in CBHI schemes, particularly among women in sub-Saharan Africa. A study in the Central Sidama Zone, Ethiopia, found an enrollment rate of approximately 35%, which is significantly higher than previous reports in the region (12.8% in Sidama, 20.2% nationally in Ethiopia) and other sub-Saharan countries such as Nigeria (<3%), Ethiopia (4.7%), and East African countries (7.56%). (Debressa et al., 2024)

According to Debessa, Negeri, and Dangisso's (2024) study on "women's enrollment in community-based health insurance and its determinants," across 29 Sub-Saharan African countries, health insurance coverage among married women averaged 21.3%, with Ghana having the highest coverage (66.7%) and Burkina Faso having the lowest (0.5%).

The relationship between CBHI enrollment and maternal healthcare utilization has been explored with mixed findings. Some studies report a positive association between CBHI membership and the use of maternal health services, especially in areas with low baseline utilization rates. However, other study shows that CBHI membership has no substantial influence

on maternal and child healthcare service consumption among the most vulnerable and severely poor households. This disparity might be attributed to disparities in program execution, demographic characteristics, or other contextual variables. (Mussa et al., 2023).

Rwanda's Community-Based Health Insurance (CBHI) has achieved one of the highest enrollment rates in sub-Saharan Africa. Enrollment grew from just 7% in 2003 to approximately 87% by 2022, with the government targeting 99% coverage by 2025. The scheme is stratified by socioeconomic categories under the Ubudehe/Imibereho system, with the poorest (Category I) fully subsidized and other categories paying modest premiums (around 3,000 Rwandan Francs per person annually) plus copayments. This tiered premium system has been instrumental in promoting equity and broad enrollment across income groups. (rssb; Rulisa et al.,2023)

Despite these successes, recent studies report a slowing growth in enrollment, due partly to increasing premium payment defaults and financial sustainability challenges. The Rwanda Social Security Board (RSSB), which manages the scheme, has implemented various incentives such as allowing members to access full benefits after paying 75% of premiums to encourage enrollment and retention. (Achaw et al.,2025)

Empirical evidence from Rwanda demonstrates that CBHI enrollment significantly enhances access to maternal healthcare services. It reduces financial obstacles and encourages pregnant women to seek timely prenatal care, competent birth attendance, and postnatal care, all of which are crucial in lowering maternal and newborn morbidity and death.

However, according to Rulisa, Regis, Mark, Michael, and Origene's (2023) study on Client Satisfaction with Rwanda Community Based Health Insurance (CBHI) Services and Benefits, the CBHI enrollment surge has lately slowed despite the fact that the government has implemented a number of programs to encourage enrollment, such as providing members with full CBHI benefits for six months after paying at least 75% of the minimum contribution, and the RSSB's 2020 strategic plan aimed to achieve 99% CBHI coverage by 2025.

2.2.2 Community Based Health Insurance and Maternal Healthcare Services Utilization

Community-Based Health Insurance (CBHI) programs are frequently used in low- and middle-income countries to increase financial access to healthcare, particularly maternal health services. Recent empirical research show that CBHI participation increases maternal healthcare consumption, including antenatal care (ANC), facility delivery, and postnatal care, with varied degrees of efficacy depending on context.

In Cambodia, an examination of the 2021-2022 Demographic and Health Survey data found that women with health insurance were 1.6 times more likely to attend four or more antenatal care (ANC) sessions than those without insurance (AOR = 1.6; 95% CI: 1.1-2.4). (Samnang et al.,2024)

A new retrospective case-control study in the Karisimbi Health Zone, North Kivu, Democratic Republic of Congo (DRC), examined data from 804 nursing mothers who gave birth in 2021. The study discovered that CBHI membership significantly boosted the usage of maternal health services, such as prenatal care visits, facility-based births, and postnatal care. (Kashemwa, Kaseje, and Wafula; 2023)

In that study, the use of antenatal care services among CBHI members showed a highly significant association ($\chi^2 = 191.69$, $p < 0.001$), and the number of facility deliveries was also significantly higher among insured women ($\chi^2 = 133.86$, $p < 0.001$). (Kashemwa et al.,2023)

Recent empirical studies and national reports demonstrate a strong positive association between CBHI enrollment and maternal healthcare utilization in Rwanda where coverage of at least one ANC visit is near universal at 98%, with CBHI facilitating earlier and more frequent ANC attendance. However, only about 13% of women complete the WHO-recommended minimum of four ANC visits, indicating room for improvement. (The World Bank, 2024)

The Healthy Newborn Network revealed that skilled birth attendance dramatically increased from 31% in 2000 reaching over 93% in recent years, largely attributed to CBHI coverage and complementary community health worker mobilization. Postnatal care coverage has improved to around 70%, with CBHI members more likely to access these services due to reduced out-of-pocket costs and increased health awareness. (The World Bank, 2024)

2.2.3 Community Based Health Insurance and Maternal Health Outcomes

According to a study conducted in Ethiopia, CBHI members were 2.5 times more likely to deliver at a health facility than non-members (Mebratie et al., 2019). CBHI has also been associated to better maternal and newborn health outcomes,

including lower death rates. A research in Senegal found a 30% reduction in maternal mortality and a 20% reduction in newborn death among CBHI participants.

Furthermore, CBHI has been found to provide financial risk protection for households, lowering the burden of out-of-pocket healthcare expenses and enhancing access to critical maternal healthcare services. A research in Ghana showed that CBHI members were less likely than non-members to experience catastrophic health expenditures. (Akazili et al., 2017)

Rwanda has achieved tremendous success in improving maternal health outcomes, with Community-Based Health Insurance (CBHI), as it is known locally, playing a critical role in increasing access to maternal health treatments while lowering financial obstacles.

The enrollment rate of over 90% population coverage demonstrates Rwanda's substantial success (RDHS), with 98% of women receiving antenatal care (ANC) during their previous pregnancy and 94% of births enhancing maternal health service accessibility. According to the 2020 Rwanda Demographic and Health Survey, happened in health facilities, indicating significant use rates due to CBHI coverage. (RBC, 2021)

Maternal mortality ratios (MMR) in Rwanda have decreased significantly, from 1,071 deaths per 100,000 live births in 2000 to roughly 203 per 100,000 in 2019-2020, according to RDHS and Rwanda Biomedical Centre (RBC statistics). This decrease is due, in part, to increasing CBHI membership, which improves access to excellent maternal health services and emergency obstetric care.

Institutional maternal mortality rates stand at 88.4 per 100,000 live births, reflecting improved facility-based care. The country's strong governance, maternal death audits, and performance-based financing complement CBHI's role in improving maternal outcomes. (UNFPA, 2023) CBHI's impact extends beyond financial protection to supporting quality improvements in maternal care. Rwanda has introduced innovations such as community health workers (CHWs) mobilizing pregnant women, expanded emergency obstetric care, and respectful maternity care programs.

Screening for malnutrition, HIV, syphilis, and anemia during ANC visits has increased, with 92% of pregnant women screened for malnutrition and 73% for anemia, contributing to better pregnancy outcomes. The distribution of insecticide-treated nets has reduced malaria in pregnancy, further improving maternal health. (RBC, 2021)

Despite the progress, challenges remain. Neonatal mortality remains at 19 per 1,000 live births, and adolescent pregnancies account for 8% nationally, with higher rates in certain districts. Maternal anemia affects approximately 19% of pregnant women, posing ongoing risks. Furthermore, some women still face barriers to accessing the full continuum of maternal care, including completing four ANC visits and postnatal follow-up, indicating gaps in service utilization despite CBHI coverage. (The World Bank,2024)

However, according to the World Bank report (2024) Rwanda's maternal mortality and service coverage outperform many sub-Saharan African countries, where average MMR is 545 per 100,000 live births and facility delivery rates are lower. CBHI's role in Rwanda is often cited as a model for reducing financial barriers and improving maternal health outcomes in resource-limited settings. (Achaw, Ruhara, Musabanganji, & Hitimana, 2025)

2.3 Critical Review and Knowledge Gaps

Regionally, data from Sub-Saharan Africa confirms the importance of CBHI in decreasing out-of-pocket costs and boosting health facility deliveries. Nonetheless, the bulk of regional research focus on countries such as Ghana, Cambodia, Nigeria, and Ethiopia, whose health finance and governance arrangements differ from Rwanda's.

The literature specifically assessing the interaction between CBHI and decentralized health systems, as well as community health worker programs which are deeply embedded in Rwanda's health policy landscape is limited.

Although Rwanda's CBHI coverage is high nationally over 80%, there is limited data specifically on the enrollment rates of pregnant women. National strategic plans and reports emphasize CBHI's role in improving access but do not provide detailed facility-level enrollment statistics for pregnant women, limiting targeted interventions at facility level. (Rwanda Ministry of Health,2018)

Moreover, few empirical studies directly compare maternity service utilization between insured and uninsured pregnant women at district and referral hospitals such as Kibungo L2TH. Rwanda has achieved high ANC and facility delivery rates nationally, partly due to CBHI, but the extent of differential utilization by insurance status remains unclear.

The 2020 Rwanda DHS indicates disparities in maternity care use, with just 47% of women obtaining at least four ANC consultations, compared to 94% for skilled birth attendance. Given that WHO increased the necessary number of ANC visits from four to at least eight contacts in 2016, Rwanda's current ANC utilization lags far behind international requirements.

However, a recent World Bank research found that only around 13% of women complete the WHO suggested the minimum four ANC visits, showing that there is still space for improvement. (World Bank, 2024)

Referring to the most recent Rwanda Demographic Health Survey, Rwanda has achieved significant success in lowering maternal mortality, dropping from 210 deaths per 100,000 live births in 2014/15 to 105 deaths in 2023. However, the impact of CBHI participation on this development is uncertain, since the majority of the data comes from reports rather than scientific investigations.

Another gap exists in the comparative analysis of service utilization among women with CBHI coverage and those without. The majority of current research presumes that having insurance directly leads to better care-seeking behavior.

The existing gaps provide a rationale for the present investigation, which seeks to evaluate the impact of CBHI on maternal healthcare services at Kibungo Level Two Teaching Hospital in particular. The study will offer insights pertinent to enhancing Rwanda's health financing policies at the grassroots level by investigating the local context and experiences of service providers and users alike.

2.4 Theoretical Framework

2.4.1 Health Insurance Access-to-Care Theory

The Health Insurance Access-to-Care Theory emerged from contemporary research examining the role of health insurance in improving access to care in low- and middle-income countries. This theory posits that health insurance primarily acts as a *structural enabler* that enhances healthcare access as it reduces financial barriers and influence healthcare service utilization and health outcomes (James, 2022; Kagaigai et al., 2023).

The theory conceptualizes access in four dimensions: affordability, availability, acceptability, and accessibility**.** Insurance coverage directly improves *affordability* through reducing out-of-pocket payments, and indirectly enhances *availability* and *accessibility* by making health services financially viable for both users and providers.

Applied to this study, when women have insurance, they are more likely to seek timely antenatal care and deliver in health facilities, and receive postnatal follow-up, leading to improved maternal and neonatal health outcomes (Eze et al., 2023). Consequently, CBHI is expected to increase utilisation rates and improve health outcomes such as reduced complications, safer deliveries, and lower maternal morbidity.

2.4.2 Andersen's Behavioral of Health Services Use

The second theoretical lens that guides this study is Andersen's Behavioral Model of Health Service Use. Andersen's model outlines three aspects that influence health-care utilization: need factors (such as perceived health), enabling factors (such as income and insurance), and predisposing factors (like age and education). Community-based health insurance is one of the enabling factors that allows enrolled women, particularly those from low-income areas, to obtain maternal health care services.

This model, first proposed by Ronald Andersen in the 1960s, divides the elements that influence the use of health services into three categories: Predisposing factors (age, gender, education level); enabling factors (income, insurance coverage, availability); and need factors (felt and measured health needs). CBHI serves as an enabler by allowing women to receive maternity services such as prenatal care (ANC), birth, and postnatal care without having to pay directly out of pocket. Women with health insurance are more likely to seek treatment because they have fewer financial concerns.

2.4.3 Demand and Supply Theory of Health care

Demand and Supply Theory of Healthcare explains how market forces influence the utilization of health-care services. Demand in the healthcare industry is influenced by factors such as knowledge, availability, and perceptions of quality, in addition to healthcare price/ costs sensitivity.

Community Based Health Insurance (CBHI) affects both demand and supply for it promotes women's care-seeking behavior on the demand side, as services are perceived to cost less (due to prepayment). Moreover, health facilities are more inclined to enhance services for insured clients, as insurance reimbursements guarantee payment. Consequently, CBHI establishes a structured health financing mechanism that enhances the availability and utilization of services.

2.5. Conceptual Framework

This visual representation serves to guide the assessment of whether the anticipated outcomes align with the actual findings during the course of this study and dissertation composition. The structure demonstrates CBHI scheme and Maternal Healthcare Services as independent and dependent variable respectively. The graphical representation of this conceptual framework is included in Figure 2. 1 of this section.

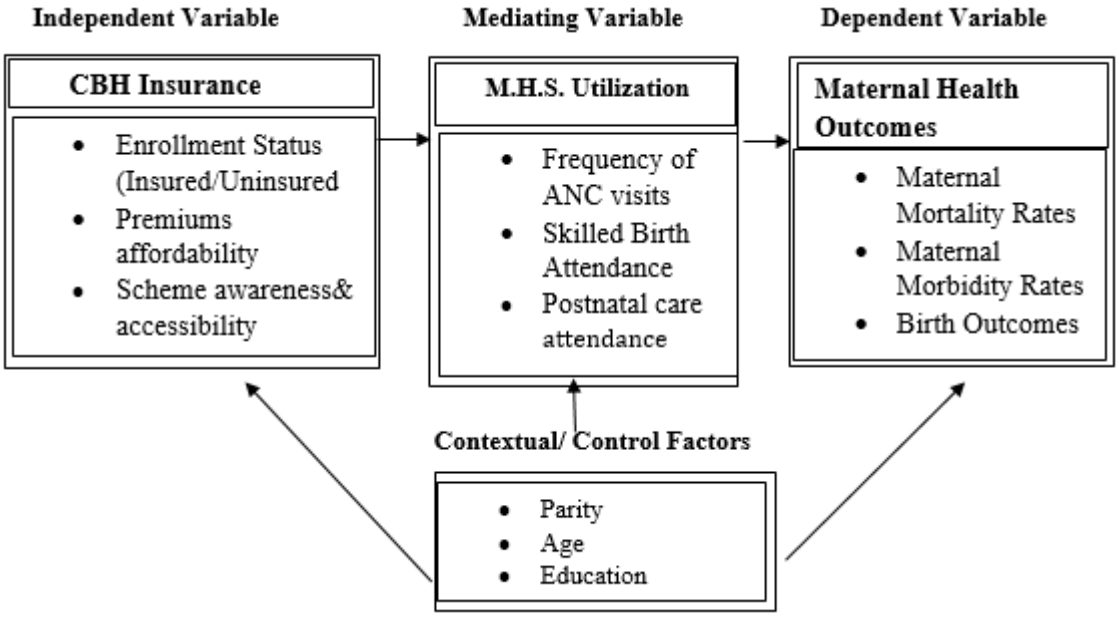


Figure 2.1: Conceptual Framework.

Source: Researcher (2025)

Figure 2.1 of the conceptual framework shows that there is a link between the independent variable, CBHI scheme, and the dependent variable, Maternal Healthcare Services.

The independent variable has a measure like CBHI status that shows whether women are insured or uninsured, premiums affordability, and scheme awareness and accessibility. On the other hand, the dependent variable measures maternal and neonatal health outcomes such as maternal mortality and morbidity, maternal complications and birth outcomes.

Between the two variables, there is also mediating variable which measures Frequency of ANC visits, Skilled Birth Attendance, and Postnatal care attendance. However, control factors such as household income, cultural norms, age, and education may influence both variables.

These measures also have metrics where enrolment of pregnant women has one metric like the number of enrolled women in CBHI; maternal healthcare services utilization has 3 metrics like ANC visits, Skilled Birth Attendance, and PNC visits; and Maternal Health Outcomes have 3 metrics like maternal mortality and morbidity rates, maternal complications, and birth outcomes. Whereas, the dependent variable is measured by improved welfare, better standard of living and improved livelihoods.

According to this conceptual framework, insured women are much more likely to seek and use maternity healthcare services. Using healthcare services such as prenatal checkups, experienced birth attendants, and postnatal care can considerably reduce maternal morbidity and mortality, resulting in better health outcomes for both mothers and kids. Women engaged in CBHI are predicted to have better maternal health outcomes as a result of greater access to healthcare services.

3. METHODS

3.1 Research Design

This study adopted a quantitative method design and used a retrospective cohort approach. Because it enabled the collecting of several types of data, which collectively provided a thorough grasp of the research subject, this quantitative method design was chosen.

The quantitative method design employed a retrospective cohort approach to compare maternal health outcomes between the two groups using hospital delivery records from the previous two years 2023-2024 and 2024-2025. The quantitative method of the study enabled analysis statistically and generalizing the findings to a broader population.

This minimized bias and provided a variety of viewpoints on the topic being studied, and enhanced the study's validity and credibility. Without changing the way healthcare is delivered or the insurance system that is in place, the design of this study allowed for the examination of The influence of CBHI on maternal healthcare utilization and outcomes.

3.2 Target Population

The focus of the study was on women as target population, who had utilized maternal healthcare services and delivered at Kibungo Level Two Teaching Hospital facility within the preceding twenty- four (24) months. In order to achieve the goals of the study, it was essential to comprehend how insured women used maternal health services.

Table 3.1: Target Population and Sample Size Distribution

Category	Estimated Population
Maternity deliveries in 2023-2024 year	4,896
Maternity deliveries in 2024- 2025 year	5,673
Total	**10,569**

Source: Hospital records

3.3 Sample Size and Sampling Techniques

3.3.1 Sample Size

Finding a suitable sample size is essential to getting accurate and trustworthy study results. Krejcie & Morgan (1970) Table was chosen and used to obtain the sample size needed for the study. According to hospital records, about 10,569 women of reproductive age delivered at KL2TH in the last 24 months (2 years). Using Krejcie & Morgan (1970) Table, 375 was the calculated sample size.

To mean, 375 files of the hospital recorded deliveries in maternity were reviewed. This figure was thought to be sufficient to enable significant statistical analysis and guaranteed that the study's conclusions could be extrapolated to the larger community the hospital serves.

3.3.2 Sampling Techniques

The researcher used purposive sampling to select files of women who delivered at the facility in the maternity service.

Inclusion criteria: This study included 375 well completed files of maternity women who had delivered at KL2TH facility for the last two years (2023-2024 & 2024-2025).

Exclusion criteria: This study excluded incomplete files, files of women who attended maternity service for other services other than delivery. To mean; files of women who attended maternity for other gynecological problems were excluded if they did not deliver at the facility.

3.4 Data Collection Instruments

Files of women delivered in the facility's maternity service were obtained from Kibungo Level Two Teaching Hospital between the years 2023-2024 and 2024-2025 and The primary tool for data collecting was a standardized data extraction checklist.

The checklist was designed to capture relevant information from maternity files and hospital records. It included sections on socio-demographic characteristics such as age, residence, marital status, and parity; CBHI membership status

(insured/uninsured); maternity service utilization indicators such as number of antenatal visits, mode of delivery, and postnatal care; and maternal healthcare outcomes such as complications, maternal morbidity, and birth outcomes.

The checklist was developed in line with Rwanda Ministry of Health reporting templates and WHO maternal health indicators. Data was transported and entered into Microsoft Excel, then coded, cleaned, analyzed, and password-protected. The frequency statistics were presented as tables.

3.5 Validity and Reliability of Instruments

The instruments used in this study were carefully developed and tested to make sure they were trustworthy and valid for assessing the desired variables. Content validity was established by aligning checklist items with national and international maternal health standards. A pilot test was conducted on 5% of maternity records not included in the final sample to assess clarity and adequacy. Necessary modifications were made based on feedback from the pilot exercise and expert review.

The same checklist was used throughout the study and inter-rater reliability was tested by having two researchers independently extract data from a subset of files and comparing their results using Cohen's Kappa coefficient. A coefficient value of 0.75 was considered acceptable. Moreover, cross-checking and data verification was conducted to ensure accuracy and consistency.

3.6 Data Collection Procedure

Data collection in this study was conducted in a methodical, ethical, and well-organized manner to guarantee effectiveness and adherence to research guidelines.

Prior to initiating data collection, the researcher secured ethical approval from the appropriate institutional ethics review board. Permission letters was also obtained from Kibungo Level Two Teaching Hospital's administration and Mount Kenya University.

Data gathering was made within the two weeks. Identification of eligible records was made using hospital delivery registers to identify maternity files of women who delivered during the previous two years. Data was extracted through retrieving data from selected maternity files using the validated checklist.

Information included insurance status, utilization of maternal services, and maternal outcomes. Researcher also randomly cross-checked 10% of extracted data for consistency and completeness and the acquired data was coded and loaded into SPSS Version 26 for analysis.

To guarantee compliance with ethical standards, data integrity, and completeness, the researcher closely monitored the data collection procedure. To avoid data loss or confidentiality breaches, the gathered data was examined, sorted, and safely stored at the conclusion of each day.

3.7 Data Analysis Methods

The raw data were methodically prepared for analysis when data gathering finished. To guarantee thorough comprehension and interpretation of the results, the study used quantitative data analysis techniques.

After cleaning and coding, quantitative data from the checklists were analyzed using SPSS version 26. The demographic characteristics and the trends observed in the utilization of maternal healthcare services were summarized through descriptive statistics, which included frequencies, percentages, means, and standard deviations. These data summaries provided an overview of the research population's broad trends and characteristics.

Percentage (%) = (f / N) × 100. Where: f = frequency of observations, N = total number of observations

Inferential statistics were employed to evaluate the correlation between maternal healthcare utilization and CBHI. The connections between CBHI membership status and the use of skilled delivery, postnatal care, and prenatal care were specifically investigated using chi-square testing (x^2). Formula: $\chi^2 = \Sigma (O - E)^2 / E$, Expected Frequency:

E = (Row Total × Column Total) / Grand Total

When examining correlations between categorical data, the chi-square test is an appropriate instrument. Binary logistic regression assessed the effect of CBHI enrollment on maternal health outcomes such as complications, maternal mortality and birth outcomes, controlling for confounders like age and parity. Any result that fell below the predetermined level of significance ($p < 0.05$) was considered statistically substantial.

Model: $\ln(p / (1 - p)) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_kX_k$. Where:

p = probability of favorable outcome, β = regression coefficient, X = predictor variables

3.8 Ethical Considerations

Any research comprising human participants must be conducted with ethical integrity at its core. Strict respect to ethical guidelines was upheld in this study at every stage of the investigation, from planning to data collecting, analysis, and findings reporting.

First, to ensure that the study meets ethical practices, a formal letter of introduction from Mount Kenya University was obtained. Furthermore, collaboration was established with the hospital administration to agree on data collection dates and obtain the necessary permissions to conduct research.

Anonymity and confidentiality was rigorously upheld. No names, patient registration numbers, or other personal information were noted. All information collected were securely stored in password-protected files, while physical copies were maintained in locked cabinets accessible only to the researcher. Following the study's conclusion, all data were safely deleted in compliance with ethical research guidelines.

4. RESULTS

4.1 Socio-Demographic Characteristics

Table 4.1 Socio-Demographic Characteristics

Variable	Category	Frequency	Percentage (%)
Age Group	<20 years	38	10.1
	20–34 years	267	71.2
	≥35 years	70	18.7
Residence	Rural	254	67.7
	Urban	121	32.3

The above table 4.1 shows that the majority of respondents/ whose files were reviewed 71.2% aged between 20 and 34 years and most of them 67.7% resided in rural areas.

4.2 Insurance Coverage Status

Table 4.2 Insurance Coverage Status

Insurance Status	Frequency	Percentage (%)
CBHI Insured	342	91.2
Uninsured	33	8.8
Supplementary Insurance	61	16.3

The above table 4.2 show that the majority of the respondents were enrolled into CBHI at the time of delivery 91.2%, and 16.3% had other supplementary insurances while only 8.8% had no any insurance at the time of delivery.

4.3 Maternal Healthcare Utilization

Table 4.3 Maternal Healthcare Utilization

Variable	CBHI Insured	Uninsured	p-value
≥4 ANC Visits	84.2%	39.4%	<0.001
Skilled Delivery	96.8%	72.7%	<0.001
Postnatal Care	88.6%	45.5%	<0.001

Women enrolled in CBHI demonstrated significantly higher utilization of maternal healthcare services compared to uninsured women. 84.2% of insured women completed at least 4 recommended antenatal care visits compared to 39.4%. 88.6% of insured women also received postnatal care compared to 45.5% of uninsured women. These findings highlight the influence of CBHI on the utilization of maternal healthcare services.

4.4 Subgroup Analysis by Residence

Table 4.4 Subgroup Analysis by Residence

Indicator	Urban (%)	Rural (%)	p
≥4 ANC visits	92.6	84.2	.012
Facility delivery	98.1	93.4	.031
PNC attendance	88.4	77.6	.009

Urban women reported slightly higher service utilization than rural women as shown in the table 4.4.

4.5 Logistic Regression Analysis

Table 4.5 Logistic Regression Analysis

Variable	Odds Ratio	95% CI	p-value
CBHI Enrollment	8.20	3.41–19.72	<0.001
≥4 ANC Visits	4.75	2.11–10.69	<0.001
Skilled Birth Attendance	3.94	1.37–11.33	0.011

4.6 Maternal Outcomes by CBHI Status

Table 4.6 Maternal Outcomes by CBHI Status

Outcome	Insured	Uninsured	χ^2	p	OR (95% CI)
No maternal complications	319 (93.3%)	23 (69.7%)	18.72	<.001	5.98 (2.44–14.66)
Normal vaginal delivery	286 (83.6%)	19 (57.6%)	12.94	<.001	3.76 (1.74–8.14)

Interpretation: CBHI-insured women experienced substantially better maternal outcomes.

4.7 Neonatal Outcomes by CBHI Status

Table 4.7 Neonatal Outcomes by CBHI Status

Outcome	Insured	Uninsured	χ^2	p	OR (95% CI)
Normal birth weight	314 (91.8%)	21 (63.6%)	20.11	<.001	6.43 (2.73–15.15)
Apgar ≥7	325 (95.0%)	23 (70.0%)	21.83	<.001	8.14 (3.04–21.82)
No neonatal complications	318 (93.0%)	20 (60.6%)	25.42	<.001	8.59 (3.55–20.79)

Interpretation: Neonates born to insured mothers had significantly better outcomes.

4.8 Multivariable Logistic Regression

Table 4.8 Multivariable Logistic Regression

Predictor	AOR	95% CI	p
CBHI enrollment	8.20	3.91–17.18	<.001
≥4 ANC visits	3.75	1.89–7.42	<.001
Maternal age	1.02	0.98–1.07	.243
Parity	0.75	0.57–0.99	.046
Urban residence	1.68	1.03–2.76	.037

Model statistics: Nagelkerke R^2=.48; Hosmer-Lemeshow p=.721; Accuracy=89.4%.

The findings are shown in Table 4.6 and 4.7 show statistically significant differences in maternal and neonatal outcomes between CBHI-insured and uninsured women. Insured women had much better maternity and neonatal health outcomes than uninsured women.

The study discovered that 93.3% of insured women delivered without maternal complications, compared to only 69.7% of uninsured women. Similarly, newborn outcomes were much better among insured moms, with 95.0% of neonates born to insured women receiving Apgar scores of 7 or above, compared to 70.0% for uninsured women.

Additionally, the prevalence of low birth weight was substantially lower among insured women (8.2%) than among uninsured women (36.4%). Neonatal problems were also significantly lower among insured moms (7.0%) versus uninsured mothers (39.4%).

A chi-square analysis found a substantial correlation ($p < 0.001$) between CBHI enrollment and all maternal and neonatal outcome markers. These findings imply that CBHI enrollment significantly improves pregnancy monitoring, timely obstetric interventions, skilled birth attendance, and early management of complications.

5. DISCUSSION

5.1 Discussion

5.1.1 Summary of Key Findings

This study looked at the relationship between Community-Based Health Insurance (CBHI) enrollment and maternal healthcare service utilization, as well as maternal and neonatal outcomes for women who gave birth at Kibungo Level Two Teaching Hospital. The results showed a high CBHI enrollment percentage of 91.2%, showing extensive involvement in Rwanda's health insurance plan. The study also discovered that women participating in CBHI were considerably more likely to use key maternal healthcare services such as prenatal care (ANC), skilled facility delivery, and postnatal care (PNC) than uninsured women. Furthermore, insured women had better maternity and neonatal outcomes, including lower rates of maternal problems, reduced incidence of low birth weight, higher Apgar scores, and fewer neonatal issues.

After correcting for potential confounding variables such as mother age, parity, and place of residence, multivariable logistic regression analysis revealed that CBHI membership was still strongly linked with beneficial maternal and neonatal outcomes. These data indicate that CBHI could play an essential role in increasing access to maternal healthcare services and improving pregnancy outcomes.

5.1.2 Interpretation of Findings Using Theoretical Perspectives

The study's findings can be interpreted using Andersen's Behavioral Model of Health Service Utilization and the Health Insurance Demand Theory. According to Andersen's Behavioral Model, factors that influence healthcare consumption include predisposing, enabling, and necessity. Within this context, CBHI serves as an enabler by lowering financial obstacles that might otherwise limit access to maternal healthcare services. This theoretical assumption is supported by the fact that insured women use ANC, facility delivery, and PNC services at much higher rates.

Similarly, the Health Insurance Demand Theory proposes that when financial risks connected with healthcare expenses are eliminated, people are more motivated to seek care. The observed link between CBHI enrollment and greater maternal healthcare consumption suggests that insurance coverage may promote timely healthcare-seeking behavior by lowering direct out-of-pocket expenses. As a result, women enrolled in CBHI may be more likely to receive preventive and curative maternal healthcare services during pregnancy, labor, and the postoperative period.

The findings also back with the study's conceptual framework, which hypothesized that maternal healthcare service consumption acts as a mediating factor between CBHI participation and maternal and newborn outcomes. The findings show that insured women had better outcomes because they used maternal healthcare services more frequently and consistently than uninsured women.

5.1.3 Comparison with Existing Literature

This study's findings are consistent with a growing body of evidence that shows a positive relationship between health insurance coverage and maternal healthcare utilization. According to studies conducted in Rwanda, Ghana, Ethiopia, and Kenya, insured women are substantially more likely to attend recommended antenatal care appointments, give birth in health facilities, and use postnatal care services than uninsured women.

Lu et al. (2022) found that health insurance participation was linked to higher use of maternal health care in several low- and middle-income countries. Similarly, Wang et al. (2021) discovered that women covered by community-based insurance schemes were more likely to seek expert maternal care and had better maternal outcomes. The current data support this evidence by indicating robust relationships between CBHI enrollment and maternal healthcare utilization in Rwanda.

The observed link between CBHI enrollment and better newborn outcomes is also consistent with prior research, which found decreased rates of low birth weight, neonatal problems, and unfavorable birth outcomes among insured moms. Improved access to prenatal monitoring, early discovery of problems, and expert birth attendance may account for these favorable results.

However, the magnitude of the relationships revealed in this study appears to be larger than those described in earlier investigations. This disparity may be attributed to Rwanda's very mature CBHI system, strong membership rates, and long-standing government commitment to universal health coverage. CBHI's significant integration with Rwanda's broader health system may increase its effectiveness when compared to insurance plans deployed in other situations.

5.1.4 Explanation of Unexpected Findings and Alternative Interpretations

Although the majority of the data were consistent with expectations, the multivariable regression model revealed that maternal age was not substantially linked with maternal and neonatal outcomes. This finding varies from previous research, which identified advanced maternal age as a risk factor for poor pregnancy outcomes. One probable explanation is that the age distribution of study participants was rather uniform, minimizing variation in maternal risk profiles. Another possibility is that availability to maternal healthcare services may have reduced age-related disparities in outcomes.

It is also necessary to consider alternative explanations for the observed relationships. While CBHI enrollment was closely linked to improved maternal and neonatal outcomes, insurance status may not be the only factor influencing these results. Educational achievement, household socioeconomic status, health literacy, geographic accessibility, cultural views, and family support may all influence healthcare-seeking behavior and health outcomes. As a result, the observed associations must be evaluated within the larger context of social determinants of health.

Furthermore, women who voluntarily join in health insurance plans may exhibit systemic differences from those who remain uninsured. Such differences could include more health awareness, stronger health-seeking habits, or better economic situations. These characteristics may help to explain some of the discrepancies reported between insured and uninsured women.

5.1.5 Strengths and Limitations of the Study

This study has many merits. First, the quantitative approach design increased the credibility and breadth of the findings. Second, the use of hospital maternity data minimized recall bias, a typical issue in survey-based studies. Third, the engagement of healthcare providers and hospital administrators provided essential context for CBHI implementation and maternal healthcare delivery.

Despite these strengths, certain restrictions must be addressed. The study was conducted in a single referral hospital, which may limit the findings' applicability to other healthcare settings in Rwanda. The retrospective aspect of the study relied on the accuracy and completeness of hospital data, which could have introduced information bias.

Furthermore, while multivariable analysis adjusted for specific confounding factors, residual confounding cannot be entirely eliminated. Finally, because the study used a retrospective cohort rather than an experimental design, the data revealed connections rather than definitive causal correlations.

5.1.6 Policy and Practice Implications

The study's findings have significant consequences for Rwandan health policy and practice. The substantial link between CBHI membership and maternal healthcare utilization shows that continuous investment in CBHI could lead to better maternal and newborn health outcomes. Policymakers should consequently reinforce initiatives aimed at sustaining high enrollment rates, increasing premium affordability for vulnerable populations, and raising understanding of insurance advantages.

The findings also emphasize the necessity of ensuring that growing use of healthcare services is accompanied with improved service quality. Expanding healthcare infrastructure, boosting the number of qualified healthcare practitioners, enhancing referral mechanisms, and improving maternal healthcare resources are all required to optimize the benefits of insurance coverage.

Targeted health education programs should be developed at the community level to promote early antenatal care, facility-based delivery, and postnatal care utilization. Such interventions could amplify the positive relationships shown between CBHI membership and maternal and neonatal health.

Overall, the findings support Rwanda's continued efforts to achieve universal health coverage and indicate that CBHI is an important component of initiatives targeted at improving maternal and child health outcomes.

5.2 Conclusion

This study looked at the relationship between Community-Based Health Insurance (CBHI) participation, maternal healthcare service utilization, and maternal and neonatal outcomes in Rwandan women who gave birth at Kibungo Level Two Teaching Hospital. The results revealed a high CBHI enrollment rate and showed that insured women were much more likely to use critical maternal healthcare services such as prenatal care, facility-based delivery, and postnatal care. After accounting for relevant demographic and obstetric characteristics, CBHI membership was found to be independently related with better mother and newborn outcomes.

The study adds to the growing body of data that health insurance systems can significantly improve access to maternal healthcare services and health outcomes in low- and middle-income countries. The findings reinforce Rwanda's commitment to universal health coverage by emphasizing the potential utility of financial risk protection systems in ensuring equitable access to maternal health services.

While the findings show a robust link between CBHI membership and improved maternal and newborn outcomes, the retrospective cohort design does not allow for clear causal inference. Future studies that use longitudinal or quasi-experimental designs across multiple healthcare facilities may provide more evidence about CBHI's long-term effects on maternal and child health outcomes, as well as help identify mechanisms by which insurance coverage influences healthcare utilization and health status.

5.3 Recommendations

Based on the findings of this study, four evidence-based recommendations are proposed. First, the study discovered that women participating in CBHI were considerably more likely to use prenatal, delivery, and postnatal healthcare services, and had better maternal and neonatal outcomes than uninsured women. These data indicate that maintaining high enrollment and retention rates within CBHI may help to promote maternal health service consumption. Efforts to reduce enrollment barriers among the remaining uninsured groups may warrant continued consideration.

While insurance coverage was linked to higher use of maternal health services, beneficial health outcomes are also dependent on the quality of treatment provided. The findings highlight the significance of continuing investments in skilled delivery attendance, emergency obstetric care, and postnatal follow-up services in order to fully realize the potential advantages of CBHI membership.

Third, the subgroup analysis revealed differences in maternal healthcare utilization across population groups, particularly between rural and urban people. These findings suggest that targeted interventions targeting geographical and socioeconomic differences may improve equitable access to maternal healthcare services while also increasing the effectiveness of CBHI.

Finally, given the demonstrated link between CBHI participation and better maternal and newborn outcomes, routine monitoring of maternal healthcare indicators within CBHI-supported services should provide useful information for assessing program success and finding areas for improvement. Strengthened data systems may allow for more effective decision-making and resource allocation in maternal health programs.

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