Factors affecting enrollment into Community Based Health Insurance scheme among indigenous Batwa in households bordering Bwindi Impenetrable National Park

Nahabwe Haven*, Andrew E. Dobson, Birungi Mutahunga R, Asaph Owamukamaeli and Mugarura Evatt

*Corresponding author
Nahabwe Haven (BSc, MPH), Deprtment of Community Health, Bwindi Community Hospital, P.O Box 58, Kanungu, Uganda, Email: hahotice@googlemail.com, Phone: +256-772544589, https://orcid.org/0000-0003-4359-7073

Author Affiliation.
Andrew E. Dobson, Bwindi Community Hospital, P.O Box 58, Kanungu, Uganda
Birungi Mutahunga R (MBChB, MPH, PhD Student), Bwindi Community Hospital, P.O Box 58, Kanungu, Uganda
Asaph Owamukamaeli (MBChB, MMED), Bwindi Community Hospital, P.O Box 58, Kanungu, Uganda
Mugarura Evatt (BA, MA, MPH), School of Public Health, Uganda Christian University

Abstract: *Millions of individuals globally suffer and succumb to health-related issues due to financial constraints hindering access to healthcare services. Community-based health insurance (CBHI) initiatives aim to alleviate these barriers, particularly among impoverished populations, yet enrollment rates remain suboptimal. This study investigates the determinants of enrollment into a CBHI scheme among the indigenous Batwa community residing near the Bwindi Impenetrable National Park. Utilizing a cross-sectional quantitative approach with simple random sampling, data were collected via semi-structured questionnaires and analyzed using STATA-12. Sample size calculation employed the Kish Leslie formula. Associations between enrollment factors were assessed using Chi-Square and Fisher's exact tests, with odds ratios and p-values presented in tabular format. Significant variables underwent multivariable logistic regression analysis, with an alpha level set at P < 0.05. Among the 100 respondents interviewed, 90% reported previous CBHI membership, with 64% currently insured. Factors significantly associated with CBHI enrollment included the household's ability to access healthcare services at the nearest CBHI facility (adjusted odds ratio [aOR]=21.9, p=0.007), the inability of household heads to articulate the CBHI membership process (aOR=9.6, p=0.001), and lack of awareness regarding the frequency of CBHI premium payments (aOR=6.3, p=0.04). Conversely, socio-demographic variables exhibited no significant association with CBHI enrollment. This study sheds light on the enrollment determinants within rural communities, particularly among marginalized populations such as the Batwa. It underscores the pivotal role of healthcare service availability and robust sensitization efforts in fostering the successful implementation of CBHI initiatives within Uganda's national health insurance scheme.*

Keywords: Indigenous people, Batwa, Community-based health insurance, Health financing, Uganda

Introduction and background

The 2010 World Health Report underscored that beyond resource availability and equitable utilization, reliance on direct payments for healthcare constitutes a formidable obstacle to achieving universal health coverage, contributing to heightened rates of catastrophic health expenditures (WHO, 2010). An estimated 150 million individuals grapple with catastrophic health expenses annually, pushing approximately 100 million people into poverty, with the most vulnerable households bearing the brunt of this burden (Kruk, Goldmann & Galea, 2009). In response, Community-based Health Insurance (CBHI) has emerged as a promising mechanism for financing equitable, high-quality, and sustainable healthcare, enhancing healthcare accessibility and offering vital risk protection to economically disadvantaged households in the face of illness 9 Parmar et al., 2012; Escobar, Griffin & Shaw, 2010; Jehu-Appiaha et al., 2010).

CBHI schemes, characterized by their voluntary nature, community-level organization, targeting of the informal sector, non-profit orientation, and adherence to the principle of risk sharing with community involvement in design and management, have garnered increasing recognition (Basaza, Criel & Van der Stuyft, 2010). While it is incumbent upon governments to spearhead efforts in mobilizing adequate funds to finance healthcare services equitably, in many developing nations, healthcare financing remains heavily reliant on direct out-of-pocket payments, despite bearing over 90% of the global disease burden (Mills et al., 2012; Gottret & Scieber, 2016). This prevailing system of healthcare financing is not only inequitable but also inefficient (Adebayo et al., 2010; Ataguba, 2010).

Despite concerted efforts to promote health insurance schemes in recent decades, global membership rates have stagnated at around 45%, with a significant concentration in developed nations, according to the World Health Organization (WHO) (Adebayo et al., 2014). In Africa, the uptake of CBHI schemes remains notably low, with only 2 million individuals enrolled out of an estimated population of 900 million in 2014 [10]. Several African countries have implemented government-supported CBHI schemes, including Rwanda (2004), Ghana (2003), Gabon (2008), Kenya (1998), Tanzania (2001), and Ethiopia (2011) (Shimeles, 2010; Sabi, 2005; Saleh, Couttolenc, & Barroy, 2014; Abuya, Thomas, & Jane, 2015; Admasu, 2016; Ally, Mariam & Moritz, 2020; Logie, Rowson, & Ndagije, 2008). However, enrollment rates in these schemes consistently hover between 1% to 10%, underscoring the persistent challenge of low uptake (Basaza, Criel, & Van der Stuyft, 2007).

For instance, in Nigeria, CBHI enrollment stands at a mere 3% of the population (Odeyemi, 2014). In East Africa, comprising Kenya, Tanzania, and Uganda, despite grappling with significant developmental challenges such as high poverty levels, rapid population growth, and chronic underfunding of the health sector, the imperative of healthcare pre-payment mechanisms remains pressing (Basaza, Pariyo & Criel, 2009). In Tanzania, despite a national target of achieving a 75% enrollment rate in CBHI schemes by 2015, current enrollment levels languish at a modest 5%, while in Kenya, only 30% of households report CBHI enrollment (Adebayo et al., 2015).

Overview of Health Insurance in Uganda

Healthcare provision in Uganda is primarily facilitated by government health facilities, private not-for-profit establishments, private for-profit facilities, and non-governmental organizations (NGOs) (Wilhelm et al., 2020; Konde-Lule et al., 2010). While government health facilities offer free investigations and treatment, out-of-pocket payments are typically expected at other healthcare providers (John & Tumwebembaire, 2023). Despite this, public health financing in Uganda remains limited, constituting only 17% of total health expenditure, with health development partners and the private sector contributing 41% and 42%, respectively, according to data from the Ministry of Health in 2016. Uganda currently lacks a public insurance program, resulting in a scenario where general health services are theoretically free at public health facilities, as per health financing policy. However, challenges in healthcare service quality often impede the realization of this ideal, leading individuals to seek alternative healthcare options (Nabyonga et al., 2011). The absence of a robust insurance framework means that paying out-of-pocket for healthcare expenses is a significant burden, particularly for the impoverished segments of the population who lack the financial means to cover such costs. This lack of prepayment mechanisms exacerbates the financial strain on the most vulnerable, perpetuating a cycle of poverty (Galárraga et al., 2010).

Efforts to establish public health insurance in Uganda have primarily been channeled through private non-profit health facilities and non-governmental organizations (NGOs) that receive grants to subsidize healthcare costs. These entities often charge a nominal user fee, representing only a fraction of the total healthcare expenditure, thereby making healthcare services more accessible to the population (Okwero et al., 2010). However, health insurance coverage in Uganda remains limited, predominantly confined to urban areas and skewed towards individuals belonging to higher socioeconomic strata. Those covered by health insurance are typically individuals employed in the formal sector, where insurance coverage may be provided through their workplaces. Conversely, individuals in the informal sector are frequently excluded from health insurance schemes, exacerbating disparities in access to healthcare services (Konde-Lule et al., 2010).

In Uganda, Community-Based Health Insurance (CBHI) schemes offer an alternative approach to healthcare financing. Originating in 1996 with just one scheme, CBHIs have gradually expanded across the country, with 28 registered schemes currently providing coverage for rural, informal, and economically disadvantaged households (Namyalo et al., 2023). Predominantly administered by faith-based hospitals and, to a lesser extent, non-governmental organizations (NGOs), these schemes aim to finance healthcare services and alleviate the burden of out-of-pocket payments (Basaza, O'Connell & Chapčáková, 2013). Despite their potential benefits, health insurance enrollment in Uganda remains low, with only approximately two percent of the population covered (Zikusooka et al., 2009; UDHS, 2011). CBHI schemes are primarily concentrated in the western and central regions, leveraging pre-existing social groups as their foundation (Nshakira-Rukundo et al., 2019). Consequently, health insurance, particularly CBHI, has yet to gain widespread traction as a healthcare financing mechanism in Uganda. Nonetheless, where implemented, CBHI schemes have demonstrated improvements in healthcare utilization and reductions in out-of-pocket expenditures among vulnerable populations (Haven et al., 2018; Agasha, Edwin, & Baine, 2019).

Kanungu district, nestled in the southwestern region of Uganda along the border with the Democratic Republic of Congo, presents a distinctive setting for healthcare provision. Characterized by limited public transportation infrastructure, including a scarcity of cars, buses, and motorcycles, the district is home to some of Uganda's most impoverished and remote populations, with an estimated total population of approximately 250,000 individuals (Uganda Bureau of Statistics, 2017).

The Government of Uganda has ratified numerous international treaties recognizing the right to health within the country's available resources. Current policies in Uganda underscore the importance of addressing social determinants of health, including access to education, healthcare services, clean water, employment, and essential amenities such as clothing, food, and security. Among the most marginalized groups in Africa and Uganda are the indigenous Batwa peoples (Berrang-Ford et al., 2012; Ampumuza, Duineveld, & van der Duim, 2020).

Historically, the Batwa in Uganda inhabited the forests of Bwindi, Mgahinga, and Echuya, leading a semi-nomadic lifestyle as hunters and fruit gatherers, relying on the forest for sustenance, shelter, religious practices, socio-economic activities, herbal medicine, and overall well-being (Mukasa, 2014; UOBDU, 2015; Ampumuza, Duineveld, & van der Duim, 2020). However, in 1991, the designation of the Bwindi Impenetrable Forest and Mgahinga Gorilla National Park as world heritage sites to protect endangered mountain gorillas led to the forced eviction of Batwa from their ancestral lands with minimal compensation (Mukasa, 2012). Since then, they have endeavored to adapt to life after displacement (Kokunda et al., 2023).

In comparison to other Ugandans residing in their new communities, the Batwa face significant disparities. They have limited access to education, experience higher rates of alcoholism, lack government representation, and receive inadequate medical care (Kabananukye, 2011; Kibukamusoke, 2016; Ntirandekura, & Christopher, 2022). Additional studies highlight profound health inequities experienced by the Batwa, including elevated mortality rates among infants and children under five, diminished life expectancy, and heightened incidence of infectious diseases. They are less likely to utilize family planning services, have reduced protection against malaria, access vaccinations, or maintain adequate nutrition (Patterson et al., 2022; Namanya et al., 2023). Moreover, the Batwa exhibit disproportionately high levels of unemployment, receive lower wages, lack influence in government decision-making processes, and encounter barriers to accessing healthcare, education, and social services. Their socio-economic status directly impacts living conditions and adversely affects health-related behaviors (Nyatanyi, 2019).

Bwindi Community Hospital was established in 2003 with the primary objective of providing healthcare services to the indigenous Batwa community, who had been displaced from their forest habitat and lacked access to essential medical care. Initially, the Batwa received free healthcare services; however, they have subsequently been requested to make nominal contributions towards their healthcare expenses. In 2010, BCH initiated the eQuality Health Bwindi (eHB) community-based health insurance scheme to mitigate financial barriers to healthcare access for individuals residing within its catchment area. eHB operates at BCH and two satellite health centers affiliated with the hospital, strategically located in proximity to the Batwa settlement. These three facilities serve as participating health facilities under the eHB scheme.

eHB offers an annual subscription fee of UGX 20,000 ($6.6) for non-Batwa adults and UGX 3,000 ($0.80) for Batwa individuals. Non-Batwa subscribers pay their annual fee in four equal installments throughout the year, while Batwa pay a single installment. Under the scheme, insured non-Batwa adults receive outpatient consultations for UGX 4,000 ($ 1.2), significantly lower than the UGX 26,000 ($7.5) charged to uninsured individuals. Similarly, insured Batwa individuals pay only UGX 500 ($0.15) for all consultations, including surgical and inpatient services. Moreover, the reduced outpatient fee for insured individuals covers investigations and treatments, whereas uninsured patients are billed separately for each test and treatment. Insured individuals, both Batwa and non-Batwa, are only required to cover 20% of the cost of surgical procedures, with other admission costs offered at a discounted rate. For Batwa households, registration under the eQuality Health CBHI occurs once annually.

For this study, participants were drawn from both those who had paid their annual subscription and those who had not, at a specific time following the deadline set by the Community-Based Health Insurance (CBHI) scheme for premium payment. Additionally, participants were selected within the insurance period of one year, commencing from March 2019 to February 2020. Despite the demonstrated benefits of CBHI in healthcare and the subsidies provided to Batwa households, only an average of 60% of households subscribe to health insurance. Many developing countries are striving to expand health insurance coverage to achieve universal healthcare, yet enrolling informal sector workers and rural populations remains a challenge. A comprehensive understanding of the factors influencing demand for health insurance among these groups is therefore essential. This study aimed to identify the factors affecting Batwa enrollment in the CBHI of eQuality Health Bwindi (eHB) between July 1, 2019, and June 30, 2020.

Methods

Study design and setting

The study employed a cross-sectional descriptive approach, primarily utilizing quantitative methods. Conducted in Kayonza Sub County, Kanungu district, the area is bordered by Kisoro District to the southwest and the Democratic Republic of the Congo to the west. Kayonza stands out among other sub-counties in Kanungu district due to its relatively high population density, estimated at 40,000 people. It is characterized by mountainous terrain and is considered a hard-to-reach area, with an altitude exceeding 2,200 meters above sea level. The healthcare infrastructure in Kayonza comprises four level two health centers (HCII), three level three

health centers (HCIII), and one hospital. Notably, one HCII facility and the hospital are designated as Community-Based Health Insurance (CBHI) health facilities.

The study focused on the Batwa settlements within Kayonza Sub County, where the eQuality Health Insurance scheme operates to provide health insurance and services to the Batwa community. Kayonza Sub County is home to seven Batwa settlements, distributed across three parishes: Ntungamo (housing the settlements of Bikuto and Kebiremu), Bujengwe (comprising the settlements of Rulangara and Byumba), and Mukono (encompassing the settlements of Karehe, Mukongoro, and Buhoma).

Sampling techniques

The study unit included eligible Batwa Households that were insured or uninsured for the period (between March 2018 and March 2019). Respondents at household level included the male household head (accepted traditional household heads in this community) and where he was deceased or not present the female household head was interviewed. The study included all household heads who were present during the period of study and agreed to participate in the study. The study excluded all household heads who declined to participate in the study or were ill, drunk or absent during the period of study.

Because of the small numbers of the Batwa people, the modified Kish Leslie formula (1987) was used to get a statistically sound sample.

$$n = \frac{N}{1 + ((N-1)/K)}$$

$$n = \frac{383}{1 + ((383-1)/120)}$$

$$n = \frac{383}{1 + 3.183}$$

n   =   92 (10% was added to cater for non-response/response errors)

102 households were to be interviewed

Data collection tool and procedures

A structured data collection questionnaire was used as the tool to collect data for variables of interest from Household Heads or eligible household members among Batwa of Kayonza Sub County. Simple random sampling was used to select the respondents from the Batwa who reside in three parishes of Kayonza Sub County. When the researcher reached in the middle of each of the settlements, guided by the Batwa settlement leader, it was divided into 4 equal parts and equal participants from each of the four parts as predetermined by the sampling proportions. This was repeated until a required number of respondents was obtained. Household heads (i.e. where males were still alive and present during the period of interview and female where male household head was deceased, absent or adult female occupant was unmarried) were selected and interviewed for this study because they were considered to be the ones that take all the decisions were interviewed to provide reliable information regarding the subject of study.

Data Variables and Sources

The independent data variables included demographic characteristics of the household head (Age, Marital Status, Religion, Level of education and Occupation), household-related factors (no of household members, number of children under-5, no of members >50, presence of a sickly household member, membership of a Bataka group, average household income and use of traditional medicine), health services related factors (distance to the CBHI health facility, time to reach nearest CBHI health facility, ease to pay user fees at CBHI facility, and health services available at nearest CBHI). The output/dependent variable was enrollment of Batwa households into CBHI scheme for 2019-2020 period.

Data Management and data analysis
All questionnaires collected from field were checked for completeness and accuracy and stored in files which were kept under lock and key. Data from questionnaires was then entered into Epidata and Epidata and used in univariate and bivariate analysis. It was then presented form of tables, descriptive texts and pie charts. All data was stored on a password protected computer only accessible to the research team. Health Insurance was categorized as either 'insured' or 'not insured' at the time of interview.

To assess the association between enrollment in health insurance and factors that may affect this, the Chi-Square test and Fisher's exact test were used and results were presented as odds ratios with p-values and 95% confidence intervals (CIs). The Chi-Square test and Fisher's exact test was used as appropriate depending on the sample size. For variables found to be significant at this level,

multivariable logistic regression was done to control for possible confounders using STATA 12. For multivariable logistic regression, variables found significant at bivariate analysis were converted into binary variables because of the small numbers of the variable values observed for the different parameters being measured. The results of this analysis were presented in table 4.7. Alpha level of significance was set at $P < 0.05$.

Ethical Considerations

Ethical clearance for the study was granted by the authors' institutes.

Results

Socio-demographic characteristics

The study findings (Table.1) revealed that a majority 11(61.1%) of those with a short membership duration (≤3 years) were uninsured, a substantial portion 12(75.0%) of individuals with a medium membership duration (4 to 6 years) were insured and a long membership period (>6 years), the vast majority (78.6%) were insured. Notably, insurance coverage was higher among individuals aged 50 years and above 18(75.0), married individuals 52(66.7%), those with secondary or tertiary education 7(100%), individuals employed in formal sectors 6(85.7%), households with fewer than five members 32(66.7%), households with three or more children under the age of 5(69.2%), households with a sickly family member 17(73.9%), households where the wife was responsible for paying the insurance premium 16(72.7%), individuals belonging to any social group 39(78.0%), and households with a monthly income exceeding 50,000 Uganda shillings 6(85.7%).

Our multivariate logistic regression analysis (Table.2), following significant bivariate associations, revealed a strong association between a household's usual source of healthcare and its insurance status. Households not utilizing CBHI facilities exhibited significantly lower odds of being insured (aOR = 21.9, p=0.007) compared to those using CBHI facilities. Similarly, households where heads accurately described the CBHI membership process had significantly higher odds of having insurance (aOR = 9.6, p=0.001) compared to those who could not describe it correctly. Additionally, household heads awareness of the CBHI premium payment frequency had significantly higher odds of insurance (aOR = 6.3, p=0.04) compared to those unaware.
The study did not identify any significant associations between a household's CBHI insurance status and several factors. These factors included household heads' views on the policy's emphasis on maternal health services for Batwa, perceptions of pricing fairness, and opinions on policy uniformity. Additionally, no significant associations were found with knowledge of the specific premium amount, use of traditional medicine, location of care sought during prior illness, or social group membership.

Discussion

The study findings found that where a household usually got their health care services was strongly associated with household insurance status. Households not utilizing CBHI facilities exhibited significantly lower odds of being insured (aOR = 21.9, p=0.007) compared to those using CBHI facilities. There were no studies found that associated CBHI insurance status and where a household sought health care from. A number of studies have looked at CBHI renewal or enrollment and availability of health care services. The quality and quantity of health services also determines enrolment and renewal of enrolment in CBHIs. A study in Ghana found that failure to meet clients' expectation about service quality at the various facilities contributed to the decision not to enroll or renew their insurance (Awunyor-Vitor, 2013). Previous studies reported that demand for health care is sensitive to the quality of service provided and that even poor households limit their demand for health care when the services are of poor quality, but are less sensitive to changes in quality of service. These studies reported that quality of health services available at the CBHI health service provides a very important factor for household CBHI enrolment or renewal (Kyomugisha, 2009; Alatinga & Fielmua, 2011; Boateng, & Awunyor-Vitor, 2013). Some of these studies further noted that among the factors that affected enrolment and renewal was perceived lack of technical competence or expertise, including the attitude of health workers (Kyomugisha, 2009; Alatinga & Fielmua, 2011).

This study's findings showed that there was significant association between household CBHI insurance status and household heads being able to describe how one becomes a member of CBHI scheme. Households where heads accurately described the CBHI membership process had significantly higher odds of having insurance (aOR = 9.6, p=0.001) compared to those who could not describe it correctly. This is in agreement with what previous studies have shown. In Maharashtra, households with greater scheme information and better understanding of insurance were more likely to renew contracts (Platteau, & Ontiveros, 2021). This is because these people are more likely to understand the benefits, the processes and the dangers of being uninsured. It is well theorized that deficient information about the insurance product and the functioning of the scheme as well as poor understanding of the insurance concept, are some of the factors that account for non-renewal decisions. A study in Tanzania had also found related findings where poor understanding of risk pooling and CBHI scheme operation was reported to deter enrolment and membership renewal. For

instance, members felt that their contributions should be used to cover their own use of services, with the money remaining available to them if they did not seek care (Kaso et al., 2022). Those who don't seem to understand the whole process of membership are therefore not likely to become members of the insurance scheme and also less likely to renew their membership. Studies in Tanzania and Ghana have also noted that the respondents' perceptions significantly influenced their decision to renew their insurance. Respondents who disagreed to the assertion that joining the scheme stands to benefit them were less likely to renew their insurance (Boateng, & Awunyor-Vitor, 2013; Macha et al., 2014).

Our study found association between household health insurance status and the household head's awareness about how often CBHI scheme premium was paid. It was found that household heads awareness of the CBHI premium payment frequency had significantly higher odds of insurance (aOR = 6.3, p=0.04) compared to those unaware. There were no studies found that explicitly looked at association with renewal of CBHI cover. A study that is closest to our study focuses on respondents' knowledge and attitude towards the CBHI scheme and renewal (Kaso et al., 2022).

Strengths and limitations of the study

This study had a 98% response rate which provided a good sample to give statistically significant result for this small population. There was sufficient sample to make population-based conclusions among the indigenous groups of people. Limitations – this study is mainly quantitative and it does not conduct qualitative analysis to understand how Batwa feel about aspects of quality, access and how they are treated while at CBHI facilities.

Conclusions

This study also notes that the availability of CBHI scheme supported health units offering health services on behalf of the CBHI schemes greatly affects enrollment. The nearer and the more readily available health services are for the population, the more likely they are to pay their insurance premium. We therefore conclude that investment into health services should be made a priority in the strategic planning for enrolment to be increased.

Data availability

De-identified data may be made will be shared on request to the corresponding author with permission from the rest of the research team.

References

Abuya, Timothy, Thomas Maina, and Jane Chuma. 2015. "Historical Account of the National Health Insurance Formulation in Kenya: Experiences from the Past Decade." BMC Health Services Research 15 (1): 1–11. https://doi.org/10.1186/s12913-015-0692-8

Adebayo, E. F., Uthman, O. A., Wiysonge, C. S., Stern, E. A., Lamont, K. T., & Ataguba, J. E. (2015). A systematic review of factors that affect uptake of community-based health insurance in low-income and middle-income countries. BMC health services research, 15(1), 1-13.

Adebayo.O., Ataguba.J.E. OA Uthman., CI Okwundu, (2014). Factors that affect the uptake of community-based health insurance in low-income and middle-income countries: a systematic protocol.BMJ Open. 2014; 4(2): e004167. doi: 10.1136/bmjopen-2013-004167.

Admasu, Kesete Birhan. 2016. "Designing a Resilient National Health System in Ethiopia: The Role of Leadership." Health Systems and Reform 2 (3): 182–86. https://doi.org/10.1080/23288604.2016.1217966. African Strategies for Health. 2016. "Health Insurance Profile: Rwanda," 8–11.

Agasha, D. B., Edwin, B. M. R., & Baine, S. O. (2019). Effect of the eQuality Health Bwindi Scheme on Utilization of Health Services at Bwindi Community Hospital in Uganda. *Frontiers in Public Health*, 7, 71.

Alatinga, K. A., & Fielmua, N. (2011). The impact of mutual health insurance scheme on access and quality of health care in Northern Ghana: The case of Kassena-Nankana east scheme. *Journal of Sustainable Development*, 4(5), 125.

Ally, Mariam, and Moritz Piatti-Funfkirchen. 2020. "Tanzania Health Financing Policy Notes." Tanzania Health Financing Policy Notes, no. March. https://doi.org/10.1596/35038

Ampumuza, C., Duineveld, M., & van der Duim, R. (2020). The most marginalized people in Uganda? Alternative realities of Batwa at Bwindi Impenetrable National Park. World Development Perspectives, 20, 100267.

Ataguba, J.E. (2012). Re-assessing catastrophic health care payments with a Nigerian case study. Health Econ Policy law, 309-26.

Basaza, R. K., Criel, B., & Van der Stuyft, P. (2010). Community health insurance amidst abolition of user fees in Uganda: the view from policy makers and health service managers. *BMC Health services research*, 10(1), 1-10.

Basaza, R. K., O'Connell, T. S., & Chapčáková, I. (2013). Players and processes behind the national health insurance scheme: a case study of Uganda. *BMC health services research*, 13, 1-13.

Basaza, R., Criel, B., & Van der Stuyft, P. (2007). Low enrolment in Ugandan Community Health Insurance Schemes: underlying causes and policy implications. *BMC health services research*, 7, 1-12.

Basaza, R., Pariyo, G., & Criel, B. (2009). What are the emerging features of community health insurance schemes in East Africa?. *Risk management and healthcare policy*, 47-53.

Berrang-Ford, L., Dingle, K., Ford, J. D., Lee, C., Lwasa, S., Namanya, D. B., ... & Edge, V. (2012). Vulnerability of indigenous health to climate change: A case study of Uganda's Batwa Pygmies. Social science & medicine, 75(6), 1067-1077.

Boateng, D., & Awunyor-Vitor, D. (2013). Health insurance in Ghana: evaluation of policy holders' perceptions and factors influencing policy renewal in the Volta region. *International journal for equity in health*, 12(1), 1-10.

Escobar, M. L., Griffin, C. C., & Shaw, R. P. (2010). Why and how are we studying health insurance in the developing world. *Escobar/Griffin/Shaw*, 1, 1-12.

Galárraga, O., Sosa-Rubí, S. G., Salinas-Rodríguez, A., & Sesma-Vázquez, S. (2010). Health insurance for the poor: impact on catastrophic and out-of-pocket health expenditures in Mexico. *The European Journal of Health Economics*, 11, 437-447.

Gottret, P.E. and Scieber, G. (2016). Health care financing revisited a practitioner's guide. Washington: World Bank Publications.

Haven, N., Dobson, A. E., Yusuf, K., Kellermann, S., Mutahunga, B., Stewart, A. G., & Wilkinson, E. (2018). Community-based health insurance increased health care utilization and reduced mortality in children under-5, around Bwindi Community Hospital, Uganda between 2015 and 2017. *Frontiers in public health*, 6, 281.

Jehu-Appiaha, C.,Aryeeteya,G., Spaana, E.,Hoopb,T., Agyepongc,I. and Baltussena ,A. (2011).Equity aspects of the National Health Insurance Scheme in Ghana: Who is enrolling, who is not and why?72(2). http://dx.doi.org/10.1016/j.socscimed.2010.10.025 157-165.

John, B. K., & Tumwebembaire, N. (2023). "Out-of-Pocket Expenditure", Abolition User Fees and the Quality of Health Services Provided by Public Health Centers IVs in Uganda: A Case of Health Centre IVs in Rujumbura Health Sub District; Rukungiri. *European Journal of Health Sciences*, 9(1), 43-62.

Kabananukye, K. (2011). Ethnic-Racial Minorities: Movement Towards Political Inclusion: The Case of the Batwa in Uganda. *Towards a Rights-Sensitive East African Community The Case of Ethnic and Racial Minorities*, 268-324.

Kaso, A. W., Yohanis, Y., Debela, B. G., & Hareru, H. E. (2022). Community-Based Health Insurance Membership Renewal Rate and Associated Factors among Households in Gedeo Zone, Southern Ethiopia. *Journal of Environmental and Public Health*, 2022.

Kibukamusoke, M. (2016). Women's Involvement And Their Civic And Political Responsibility Among The Batwa Ethnic Minority Group In Kanungu District South Western Uganda.

Kidd, C., & Zaninka, P. (2008). Securing Indigenous Peoples' Rights in Conservation: A review of of south-west Uganda. Forest Peoples Programme (FPP) , England, Wales.

Kokunda, S., Nahabwe, H., Nahamya, J., Niwamanya, S., Mazirwe, R., Gougsa, S., ... & Redvers, N. (2023). Batwa Indigenous Peoples forced eviction for "Conservation": A qualitative examination on community impacts. *PLOS Global Public Health*, 3(8), e0002129.

Konde-Lule, J., Gitta, S. N., Lindfors, A., Okuonzi, S., Onama, V. O., & Forsberg, B. C. (2010). Private and public health care in rural areas of Uganda. *BMC international health and human rights*, 10, 1-8.

Kruk, M. E., Goldmann, E., & Galea, S. (2009). Borrowing and selling to pay for health care in low-and middle-income countries. *Health Affairs*, 28(4), 1056-1066.

Kyomugisha, E. L., Buregyeya, E., Ekirapa, E., Mugisha, J. F., & Bazeyo, W. (2009). Strategies for sustainability and equity of prepayment health schemes in Uganda. *African health sciences*, *9*(2).

Logie, D. E., Rowson, M., & Ndagije, F. (2008). Innovations in Rwanda's health system: looking to the future. *The Lancet*, *372*(9634), 256-261.

Macha, Jane, August Kuwawenaruwa, Suzan Makawia, Gemini Mtei, and Josephine Borghi. "Determinants of community health fund membership in Tanzania: a mixed methods analysis." *BMC health services research* 14, no. 1 (2014): 1-11.

Mills, A., Ataguba, J.E., Akazil, J., Borghi, J.,Garshong, B.,Makawa,S,(2012). Equity in financing and use of health care in South Africa, Ghana and Tanzania, 380,126-33.

Mukasa, N. (2012). The Batwa indigenous people in Uganda and their detachment from forest livehood: Land eviction and social plight. *Anuario de acción humanitaria y derechos humanos= Yearbook of humanitarian action and human rights*, (10), 71-84.

Mukasa, N. (2014). The Batwa indigenous people of Uganda and their traditional forest land: Eviction, non-collaboration and unfulfilled needs. *Indigenous Policy Journal*, *24*(4).

Nabyonga Orem, J., Mugisha, F., Kirunga, C., Macq, J., & Criel, B. (2011). Abolition of user fees: the Uganda paradox. *Health policy and planning*, *26*(suppl_2), ii41-ii51.

Namanya, D. B., Bikaitwoha, E. M., Berrang-Ford, L., Kiconco, A., & Napyo, A. K. (2023). Malaria Prevalence and Associated Risk Factors among Batwa Indigenous People of Kanungu District in Southwestern Uganda: Does "Place" Matter?. *Journal of Biosciences and Medicines*, *11*(7), 223-251.

Namyalo, P. K., Mutatina, B., Byakika, S., Walimbwa, A., Kato, R., & Basaza, R. K. (2023). The feasibility analysis of integrating community-based health insurance schemes into the national health insurance scheme in Uganda. *Plos one*, *18*(4), e0284246.

Nshakira-Rukundo, E., Mussa, E. C., Nshakira, N., Gerber, N., & Von Braun, J. (2019). Determinants of enrolment and renewing of community-based health insurance in households with under-5 children in rural south-western Uganda. *International journal of health policy and management*, *8*(10), 593.

Ntirandekura, M., & Christopher, F. Impact of Batwa Settlement Patterns on Their Social Economic Development: A Case Study of Kisoro Municipality.

Nyatanyi, T. (2019). *Understanding Barriers to Accessing Healthcare Among the Most Deprived of the Deprived–the Case of the Batwa in Southwestern Uganda* (Doctoral dissertation, Harvard University).

Odeyemi, I. A. (2014). Community-based health insurance programmes and the national health insurance scheme of Nigeria: challenges to uptake and integration. International journal for equity in health, 13(1), 20.

Okwero, P., Tandon, A., Sparkes, S., McLaughlin, J., & Hoogeveen, J. G. (2010). Fiscal space for health in Uganda.

Parmar, D., Souares, A., De Allegri, M., Savadogo, G., & Sauerborn, R. (2012). Adverse selection in a community-based health insurance scheme in rural Africa: implications for introducing targeted subsidies. *BMC health services research*, *12*(1), 181.

Patterson, K. A., Yang, S., Sargeant, J., Lwasa, S., Berrang-Ford, L., Kesande, C., ... & Harper, S. L. (2022). Socio-demographic associations with pregnancy loss among Bakiga and Indigenous Batwa women in Southwestern Uganda. *Sexual & Reproductive Healthcare*, *32*, 100700.

Platteau, J. P., & Ontiveros, D. U. (2021). Cognitive bias in insurance: evidence from a health scheme in India. *World Development*, *144*, 105498.

Sabi, W. K. (2005). *Mandatory community-based health insurance schemes in Ghana: prospects and challenges* (Master's thesis, University of Cape Town).

Saleh, K., Couttolenc, B., & Barroy, H. (2014). *Health financing in the Republic of Gabon*. World Bank Publications.

Shimeles, A. (2010). Community based health insurance schemes in Africa: The case of Rwanda.

Turcotte-Tremblay, A. M., Haddad, S., Yacoubou, I., & Fournier, P. (2012). Mapping of initiatives to increase membership in mutual health organizations in Benin. *International journal for equity in health*, *11*(1), 1-15.

Udhs, I. (2011). Uganda demographic and health survey. *Uganda Bureau of Statistics, Kampala Uganda*.

Uganda Bureau of Statistics. (2017). *National Population and Housing Census 2014: Analytical Report: Evidence for Planning and Improved Service Delivery*. Uganda Bureau of Statistics.

United Organisation for Batwa Development in Uganda (UOBDU), The Coalition of Pastoralist Civil Society Organisations (COPACSO), The Forest Peoples Programme (FPP), The International Work Group for Indigenous Affairs (IWGIA) Fifth periodic report of the Republic of Uganda presented at the 56th Ordinary session of the African Commission on Human and Peoples' Rights, 21 April to 7 May 2015.

WHO, (2010). Obstacle in the process of establishing a sustainable National Health Insurance Scheme. A technical Brief for Policy-Makers, Ghana.

Wilhelm, J. A., Paina, L., Qiu, M., Zakumumpa, H., & Bennett, S. (2020). The differential impacts of PEPFAR transition on private for-profit, private not-for-profit and publicly owned health facilities in Uganda. *Health policy and planning*, *35*(2), 133-141.

Zikusooka, C. M., Kyomuhang, R., Orem, J. N., & Tumwine, M. (2009). Is health care financing in Uganda equitable?. *African health sciences*, *9*(2).

Table 1. Social demographic characteristics of household heads of indigenous Batwa households (n=100)

Variable	Insured (%)	Not Insured (%)
Insurance cover period		
Short (≤ 3 year)	8(44.4)	11(55.6)
Medium period (>3 but ≤ 6 years)	12(75.0)	4(25.0)
Long period (>6 years)	44(78.6)	12(21.4)
Never insured	0(0)	10(100)
Age in years of household head		
20-30	30(63.8)	17(36.2)
31-40	7(41.2)	10(58.8)
40-50	9(75.0)	3(25.0)
50+	18(75.0)	6(25.0)
Marital Status of Household head		
Married	52(66.7)	26(33.3)
Not Married	12(54.5)	10(45.5)
Highest level of Education of Household head		
No education	34(58.6)	24(41.4)
Primary	23(65.7)	12(34.3)
Secondary	6(100.0)	0(0.0)
Tertiary	1(100.0)	0(0.0)
Occupation of the household head		
Agriculture	42(62.7)	25(37.3)
Formal Employment	6(85.7)	1(14.3)
Other (i.e. tourism related)	16(61.5)	10(38.5)
Number of household members		
Size Greater than or equal to 5	32(66.7)	16(33.3)
Less Than 5 Members	32(61.5)	20(38.5)
Number of Children under-5 in this household		
Greater than or equal to 3 children	9(69.2)	4(30.8)
Less than 3 children	54(62.8)	32(37.2)
None	1(100.0)	0(0.0)
Household members Greater than 50 Years of age		
Yes	25(62.5)	15(37.5)
No	39(65.0)	21(35.0)
Presence of sickly members in this household		
Yes	17(73.9)	6(26.1)
No	47(61.0)	30(39.0)
Who pays for Health Insurance in your household?		
Husband	40(66.7)	20(33.3)
Wife	16(72.7)	6(27.3)
Other Member in the household	8(44.4)	10(55.6)
Membership in any other social group		
Yes	39(78.0)	11(22.0)
No	25(50.0)	25(50.0)
Household head monthly income		
No income	12(60.0)	8(40.0)
5000-50000	46(63.0)	27(37.0)
Greater than 50000	6(85.7)	1(14.3)

Table 2: Multivariate analysis, using the most significant variables from the bivariate analysis, all converted into binary variables (n=100)

Variable	Insured (%)	Not Insured (%)	OR	P-value	aOR (p-value)
Membership in any other social group					
Yes	39(78.0)	11(22.0)	1		
No	25(50.0)	25(50.0)	3.5	0.004	1.6 (0.48)
Where do you usually get your health care services?					
CBHI Scheme Health facility					
Other	56(82.4)	12(17.6)	1		
	8(25.0)	24(75.0)	14.0	0.000	21.9(0.007) *
The last time you or family member was ill, where did you receive your health care					
CBHI Scheme Health facility	57(79.2)	15(20.8)	1		
Other	7(25.0)	21(75,0)	11.4	0.000	0.6 (0.68)
Does your house use of Traditional Medicine to treat common illnesses					
Yes, and regularly	28(52.8)	25(47.2)	1		
We use it sometimes/We do not use it	36(76.6)	11(23.4)	0.3	0.014	0.4 (0.10)
Describe how one becomes a member of CBHI scheme					
Correctly describes the process					
Does not Correctly describe the process/Not sure	48(80.0)	12(20.0)	1		
	16(39.0)	25 (61.0)	6.0	0.000	9.6 (0.001) *
How often is CBHI Scheme premium paid					
Annual	59(75.6)	19(24.4)	1		
Other/Not Sure	5(22.7)	17(77.3)	10.6	0.000	6.3 (0.040) *
How much do pay for CBHI Scheme premium					
3000 (Correct amount)	60(69.8)	26(30.2)	1		
Other (Not Correct)/Not Sure	4(28.6)	10(71.4)	5.8	0.003	0.4 (0.42)
Uniformity of the current CBHI policy					
Yes	56(67.5)	27(32.5)	1		
No/Not Sure	8(47.0)	9(53.0)	2.3	0.011	2.1 (0.37)
Provision of realistic pricing i.e. copayment fees					
Yes	60(71.4)	24(28.6)	1		
No/Not Sure	4(25.0)	12(75.0)	7.5	0.000	1.4 (0.76)
CBHI policy Emphasis on provision of maternal health services for Batwa					
Yes	47(69.1)	21(30.9)	1		
No/Not Sure	17(53.1)	15(46.9)	2.0	0.120	0.2 (0.12)

Significant association for p<0.05