

Malaria Illness and Accessing Healthcare in an African Indigenous Population: A Qualitative Study of the Lived Experiences of Uganda's Batwa in Kanungu District

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Abstract

Purpose: Malaria continues to be a public health threat, especially in sub-Saharan Africa, including Uganda. While Batwa Indigenous People (IPs) face a higher burden of malaria, there is limited understanding of their malaria-lived experiences. We assessed and characterized malaria illness and accessing healthcare lived experiences of the Batwa in Kanungu district to inform contextually and culturally appropriate public health interventions.

Methods: An exploratory qualitative study was conducted in 5 Batwa settlements where 5 Focus Group Discussions (n = 36) and 13 Key Informant Interviews (n = 13) were held. Data were collected using printed guides and voice recorders in April 2018. Transcripts from the data that captured the lived experiences of the symptoms, prevention, treatment and barriers to accessing formal healthcare services were applied to *Atlas.ti* a qualitative data analysis software and condensed into codes, categories, and themes. **Results:** Many Batwa have experienced malaria in their households, and they know its causes and risk factors, like not sleeping under insecticide-treated mosquito nets (ITNs), living near water bodies, prevention measures like the use of ITNs, and vector management. The lived experiences demonstrate malaria management by an Indigenous population in a rural setting and comprised

detecting malaria symptoms, use of herbs as first line of treatment, buying medicines from drug shops, and village health teams (VHTs) treatment. For many Batwa accessing formal healthcare is normally a second option. Barriers for malaria treatment included: long distances to health facilities, geographically difficult terrain, economic constraints, irregular health outreaches, and stockouts of malaria medicines at health facilities. **Conclusion:** This study characterized Batwa's malaria illness lived experiences and access to healthcare in rural remote settings. These experiences are essential in appreciating the ways in which Indigenous populations understand and manage common illnesses and how appropriate policies and interventions can be developed.

Keywords

Accessing Healthcare, Batwa IPs, Lived Experiences, Malaria Illness, Uganda

1. Introduction

Malaria causes more than 200 million cases of illness and 400,000 deaths each year across 90 countries [1] [2]. Despite international efforts to control and eliminate malaria for the past century, the disease continues to be a public health threat, particularly in sub-Saharan Africa [3]. Many risk factors contribute to development of malaria illness including; sex, age, outdoor activity in the evening, awareness about malaria, use of long-lasting insecticidal nets (LLINs), application of Indoor Residual Spraying (IRS), and one's occupation [4]. Malaria illness has also been associated with other risk factors like relative poverty, not owning a bed net, iron sheet roofing with openings for mosquito entry, not avoiding mosquito bites [5] and environmental factors such as presence of bushes and stagnant water around homes, rainfall, low altitude and high temperatures favour the breeding of malaria vectors as well as parasite reproduction within them [6]. Although malaria is a life-threatening disease, it is preventable and curable [7], and early diagnosis and treatment of malaria reduces the disease, prevents deaths and contributes to reducing transmission [7]. Uganda's malaria treatment policy is to use artemisinin-based combination therapy (ACT) as first-line treatment, with parasitological confirmation for malaria before the therapy using either rapid diagnostic test (RDT) or microscopy [8] [9] [10]. WHO strongly advocates for a policy of "test, treat and track" to improve the quality of care and surveillance [9].

In Uganda, malaria is endemic in over 95% of the country and the leading cause of morbidity and mortality, accounting for 30% - 50% of outpatient visits, 15% - 20% of all hospital admissions, and up to 20% of all hospital deaths [11]. In the context of malaria and healthcare, Indigenous Peoples often find it difficult to access appropriate mainstream primary health care services, which often require more than those services that are situated within easy reach, but also the affordability and appropriateness [12]. Ensuring the accessibility of health care

for Indigenous peoples who are often faced with a vast array of additional barriers including experiences of discrimination and racism, can be complex [12]. Understanding malaria in its social realities as a whole also requires taking interest in the perceptions and practices of individuals in the communities concerned, and individuals' experiences with health services and treatments—whether biomedical, traditional or syncretic [13]. Worldwide, compared to non-Indigenous populations, Indigenous populations frequently experience higher disease burdens and mortality rates [12] [14] [15]. Higher disease burdens are also, in part, attributable to health services that do not consider Indigenous ways of knowing and understanding of health and illness. Without such considerations, many public health programs in Indigenous contexts are rendered ineffective [16] [17].

Indigenous health research, particularly in Africa—which is home to over 14 million self-identified Indigenous peoples—remains inequitably represented within the health literature [18]. Actually, the state of health care provided to Indigenous people around the world is an often ignored and under-researched topic [19]. Still, Indigenous people's access to adequate health remains one of the most challenging and complex areas that need urgent focus as a major health issue as well as examining alternative health care frameworks [20]. As such, there is a limited evidence base for Indigenous public health policy, procedures, and program development in Africa [15] [18].

The Batwa, an Indigenous population live in southwestern Uganda in the districts of Kanungu and Kisoro. Many Batwa especially children under five years die from malaria as they cannot afford treatment. Like Batwa, other Indigenous people like the San in Namibia [21], Tribal communities in India [22] and Guna indigenous people in Panama [23] are affected by malaria as a major health concern. The Batwa Indigenous people originally lived as hunter-gatherers for centuries and depended on the forest for all their livelihoods, but since 1991 they were forcibly evicted and moved into settlements where they now live in a new social setup outside the forest [24]. The communities in Kanungu are small, with 25 - 200 people, and relocated in 10 settlements across the district (Figure 1). The total Batwa population of Kanungu District ranges between 500 and 700, with recent studies show that Batwa's most significant health risk is increasing incidence of malaria [5] [24] [25]. Batwa communities have become more vulnerable after expulsion from the forest since a key aspect of their adaptation and resilience in the forest was associated to historical adaptation of their Indigenous health systems to forest-based medicinal plants and products [15] [24] [26].

This study is grounded within Andersen's Behavioural and Access to Medical Care Model [27], which examines the health care system in terms of predisposing factors, enabling resources and need factors. According to the model; *predisposing factors* are those socio-cultural characteristics of the individual that exist prior to their health condition (in this case malaria), *enabling resources* reflect the means or logistics required to obtain or utilize health care services—in

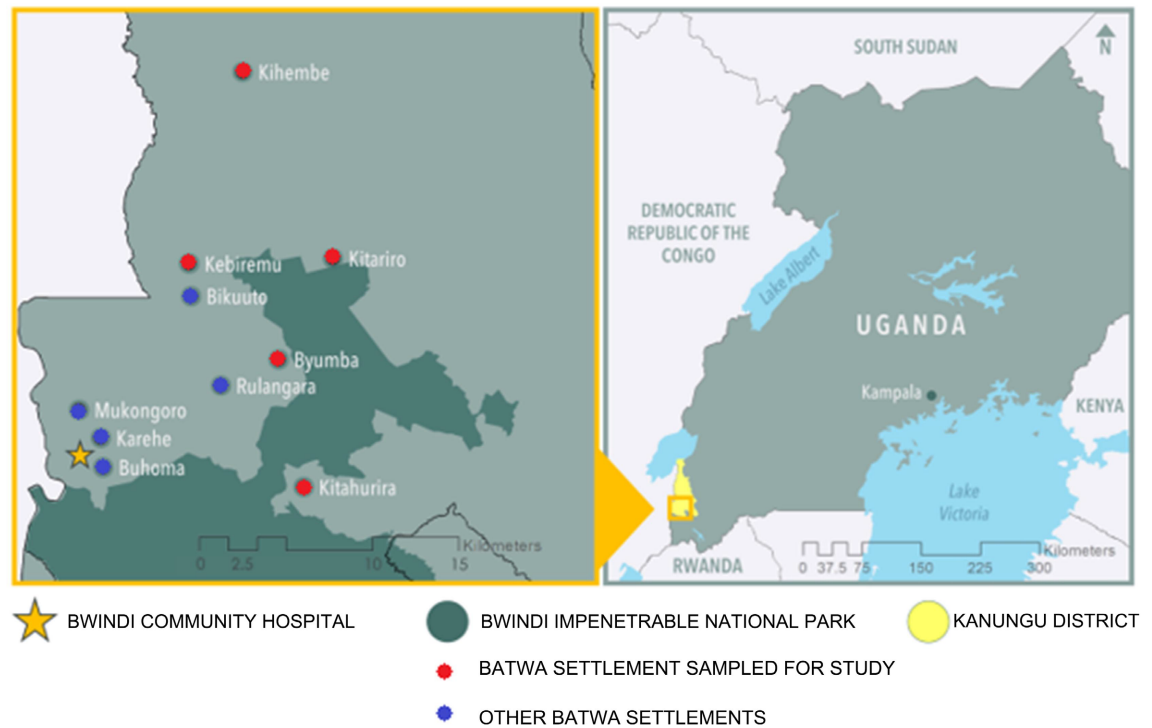


Figure 1. Map of study area showing Kanungu District and Batwa Settlements (Adopted and adjusted with permission from Steele *et al.* RRH 2021; 6510).

the case of the Batwa the experience of displacement and marginalization; the challenges related to access to care (in this case malaria treatment) and, finally *need factors*, which are the most immediate cause of health service use and reflect the perceived health status of an individual. This research sought to characterize the malaria lived experiences of Batwa Indigenous people related to symptoms, prevention, treatment and barriers to accessing formal health care services for malaria.

2. Methods

In this research we partnered with the Batwa settled in Kanungu District Uganda through the Batwa Development Programme, a faith-based not-for-profit organisation pioneering Batwa rights. The study design, data collection, and data interpretation processes followed a community-based participatory research approach, which was premised on principles of equitable participation, collaboration, trans-disciplinarity, social equity, capacity building, and knowledge translation, as is recommended when working with Indigenous communities [12] [28] [29]. Some community members contributed to the study design; participated in data collection as surveyors, translators, and interviewers; and in results interpretation [30] [31] [32].

2.1. Study Design

An exploratory qualitative study was carried out in Kanungu district, south

western Uganda, in five Batwa settlements in the district. Qualitative research gathers participants' experiences, perceptions, and behavior. It answers the hows and whys instead of how many or how much [33]. Five Focus Group Discussions (FGDs) with an average of 5 participants each were organized in five purposively selected Batwa settlements to elicit malaria lived experiences of Batwa people, in particular, the symptoms, prevention, treatment and barriers to accessing formal health care services. On average each FGD took one hour. The criteria for selection of Batwa settlements to conduct FGDs were: 1) high malaria prevalence in previous surveys [5] [34] [35] [36] (*i.e.*, Kebiremu, Kitariro & Byumba), 2) proximity to health facilities (*i.e.*, those very near like Byumba & Kitariro), 3) diverse *geography* or *place* factors, especially high altitude (Kitahurira), low altitude (Kebiremu), location near wetlands, forest and river basin (Kihembe & Kitariro).

In addition, 13 in-depth key informant interviews (KIIs) ($n = 13$) were conducted to bring out the lived experiences of Batwa of key malaria risk factors and enabling factors for access to the formal health system. The KIIs included 7 Batwa resource persons and six non-Batwa health workers. On average a KII took 45 minutes. Responses from Batwa FGDs were triangulated with responses from KIIs and vice-versa for validity.

2.2. Study Setting

Kanungu district in Southwestern Uganda is located 29°50'E and 0°45'S of the Equator, covers an area of 1297.5 sq. km. and it borders Rukungiri district to the east, the Democratic Republic of Congo (DRC) in the west, Kabale and Kisoro districts on the south. The district is partly covered by impenetrable forests that stretch from Rwanda and DRC inhabited by mountain gorillas. Like much of Uganda, Kanungu typically experiences two rainy seasons—March to May and August to October—with an annual rainfall of 1000 - 1500 mm. The district is largely a rural area of rolling hills located at an average elevation of 1310 m above sea level [37]. The study was conducted in 5 of the 10 Batwa settlements in the district (**Figure 1** adopted and modified from [38]).

2.3. The Study Population

The Batwa population in Kanungu District was resettled in 10 settlements. Originally living in the Bwindi Impenetrable Forest as hunter-gatherers, in 1991 the Batwa were removed by government to establish national park to protect mountain gorillas. The communities are small with 25 - 200 people. The total Batwa population Kanungu district ranges between 500 and 700 [39]. The Batwa now engage in small subsistence cultivation, tourism activities and offering paid labour [24].

2.4. Qualitative Data Collection and Analysis

2.4.1. Focus Group Discussions (FGDs) & Key Informant Interviews (KIIs)

FGD and KII guides were used to collect data. They had questions related to

malaria disease, experiences of accessing malaria health care services from the onset of malaria symptoms, travelling to the health facility, and accessing health services up to the time of exit from the health facility. The guides were developed in English and translated to *Runyankore/Rukiga*, the local language mostly used in the area of study and by the Batwa. Data were collected by the principal investigator (PI) using both paper-based printed guides and voice recorded. The principal investigator was supported by 2 research assistants (Ras)—one female mutwa and one male non-mutwa who took notes and recorded proceedings of the FGDs and KIIs. In order to limit distractions, the FGDs and interviews were conducted in ideal locations suggested by the participants, mostly away from other members of the community e.g., under a tree or in a room.

2.4.2. Qualitative Data Analysis

All FGDs and KIIs were tape-recorded with the consent of the participants. The recordings were transcribed verbatim into English by the two research assistants. The principal investigator reviewed the transcripts in order to ensure they were a true record of the data collected. A few corrections were done to produce final transcripts. Then, the transcripts were imported into a qualitative data analysis software, *Atlas.ti* Knowledge Work Bench Version 6.10.15, (Educational Single User License©1993-2021 by *Atlas.ti* GmbH, Berlin).

Proximity Relational Content Analysis was used for analyzing the transcribed interviews. The unit of analysis in this study was text based on reflective dialogues on malaria disease symptoms, prevention, treatment options and experiences of accessing malaria health care services from the time when malaria was suspected to the time of exit from the health facility. The meaning units were identified and condensed into codes by labelling of key words automatically using *Atlas.ti* software, which enhanced creation of categories, groups of content that shared commonality [40] [41] [42].

Quality of the data was maintained by cleaning of errors of the text in all available data. Coding was to help in separating data into categories and themes so that data from different sources (*i.e.*, FGDs and KIIs) could be easily organized and compared. During the analytical process, there was thorough discussion between the PI and Ras about the structure of codes, categories and themes.

2.5. Ethics Approval

The study obtained ethics approvals from Institutional Review Board (IRBs) of Mbarara University of Science and Technology, (ref. 29/04-18) and by the Uganda National Council for Science and Technology (ref. HS2460). Administrative clearance was sought and given from Batwa Development Programme (BDP) and Kanungu District Local Government. Prior to all FGDs and KIIs the principal investigator introduced the research team, and explained the purpose of the study. Verbal consent was then sought, since majority of Batwa do not read or write. Interviews and discussions would only proceed upon receipt of consent from all participants.

3. Results

3.1. Characteristics of the Participants

The majority of participants in the FGDs were female (n = 19) representing 73.1%, while males were fewer (n = 7) representing 26.9%. The females were aged between 24 and 80 years, while the males were aged between 22 and 50 years (Table 1). Females are more involved in caring for the sick and this would enrich the lived experiences. Regarding KIIs; out of the 13 interviewees 7 were Batwa resource persons in the community and 6 were non-Batwa health workers at health facilities where Batwa access health services. The inclusion of non-Batwa among KIIs in the study aimed at obtaining views from the Batwa as well as non-Batwa. The non-Batwa interviews provided context in terms of the health system and were considered separately, alongside Batwa perspectives [40] [41] [42].

In terms of education attainment, majority participants in the FGDs had primary and secondary education. Overall, 13 KIIs were conducted *i.e.*, a total of n = 7 KIIs across the 5 Batwa communities (Byumba n = 1, Kitahurira n = 1, Kihembe n = 2, Kitariro n = 2, and Kebiremu n = 1). Also 2 non-Batwa (Bakiga) community members (in Kitariro and Kihembe), and non-Batwa representatives from BCH (n = 2), Byumba HCII (n = 1), and Kanyashogy HCII (n = 1). The community KIIs; were community leaders while the representatives BCH, Byumba HCII and Kanyashogy HCII comprised public health officers and nurses. For the KIIs more than 50% (n = 9) had secondary and tertiary education with average age of 34.5 years.

3.2. Pre-Disposing Factors

Causes of Malaria and Knowledge of Malaria Prevention

The respondents had divergent views on what causes malaria in the Batwa community. The majority of the respondents correctly associated malaria with mosquitoes based on what they had experienced and known about malaria. However, others believed it to be caused by other factors:

Going in dirty water, as in walking barefoot in water considered dirty: swamps, mud. FGD1 Kitariro.

Being bitten by mosquitoes, poor diet, and coldness. FGD 3 Kitahurira & FGD 4 Byumba

Table 1. Characteristics of participants in FGDs.

FGD	Settlement	No People	No. F/male	No. Male	Lowest Age	Highest Age	Average Age
1	Kitariro	5	3	2	26	56	38
2	Kihembe	5	4	1	24	35	46.2
3	Kitahurira	5	4	1	24	50	40.4
4	Byumba	6	5	1	27	80	48
5	Kebiremu	5	3	2	22	37	28.8

Not sleeping under mosquito nets, living near water bodies, such as swamps. FGD 2 Kihembe.

The majority of participants' knowledge on the ways of preventing and controlling malaria at the community level concentrated on the use of mosquito nets;

If you sleep under the mosquito net malaria will not catch you. Mosquito nets were distributed to us, but are inadequate in numbers not covering the total number of people in the household leaving others without. FGD 3 Kitahurira.

Mosquito nets were distributed to us, we all have them. I got 4 nets, every child has his/her net up. The rats damaged them all and they are all dysfunctional except the one on my bed. FGD 4 Byumba.

Meanwhile other participants knew environmental malaria control such as slashing, early closure of the house entrances in the evening.

Slash bushes around the home, removal of rubbish, closing windows and doors in the evening can prevent malaria. FGD 2 Kihembe & FGD 3 Kitahurira

Other participants mentioned government programme that was implemented in the region to control the mosquitos and malaria.

Village Health Teams (VHTs) and health workers from Bwindi Community Hospital visit our households to sensitize us about malaria prevention. KII-06.

Yes, we access preventive measures like mosquito nets...but we are still careless on other prevention measures. The lower part of Kebiremu is so badly off, with bushes all over the place. KII-07.

3.3. Enabling Environment

Enabling Experiences of Accessing Malaria Treatment

The majority of the participants interviewed had beliefs of using other remedies such as herbs prior to accessing health facilities.

I used herbs to treat the child, but these days we go to the health facility immediately because of closeness to the health centre. FGD1 Kitariro.

I boil water for them to bathe in order to reduce the temperature, the problem is coldness because this area is colder. Then I apply some herbs, if there is no improvement, I go to the health facility. I use herbs such as Ebizinya muriro, applied with warm water. FGD3 Kitahurira.

Some of the participants reiterated that the use of the herbs among Batwa has reduced to some extent compared to when they had just come out of the forest over 20 years ago. It is now common for Batwa people to seek western medicine at the health facilities in the area.

In the past we used herbs a lot, but nowadays we do not use them a lot as we go to the hospitals especially now that even some of the herbal resources, we used to rely on have dwindled. FGD2 Kihembe.

I do self-treatment using herbs, then going to the hospital later. FGD 3 Kitahurira.

For one participant in Kitahurira, the first course of action on suspecting malaria was purchasing drugs from a nearby drug shop.

“I bought some drugs at the shop...after taking those drugs, I did not feel well. I took the drugs in the morning. By evening, I was worse. I spent two days at home after that before eventually going to Kanyanshogye health facility, where I was tested and found to have severe malaria and was given coartem, Panadol, and an injection. I took the drugs as I was directed and I felt better after two days of taking them”. FGD3 Kitahurira.

Other participants also mentioned the role played by VHTs in the treatment of malaria in the community.

VHTs have helped us in quick treatment of malaria. Here one of us Batwa was trained as VHT and she helps us to advise us and to give us some tablets before we can go to the health facility. FGD 2 Kihembe.

Sharing of malaria medicines was also noted by some participants. Participants agreed that this practice is common in the area.

I developed high temperature and headache. I never went to the health facility, instead I took leftover tablets from my mother-in-law, but I still felt unwell. FGD 4 Byumba.

3.4. Need Factors

Lived Experiences of Malaria Symptoms

Many of the participants talked about what they knew about malaria disease, the signs and symptoms, their experiences as patients who suffered what they defined as “the malaria disease”. From the FGDs and KIIs, the definition of the signs and symptoms of malaria were based on individual experiences and the local context as illustrated below:

Malaria breaks up the back, whole body, eyes water, legs weaken, causes terrible pain in the head, and you become weak, have no peace. FGD1 Kitariro.

I determined malaria by experiencing shivering, high temperatures and even if they gave me the food, I like most, I would fail to eat it. KII-02.

Malaria brings sourness in the mouth, making the taste of water or food in the mouth sour, leading to vomiting. Another thing, I also get diarrhea, increase in temperature and body weakness. FGD1 Kitariro.

On the one hand others described malaria signs and symptoms that come in form of fever causing goose pimples, shivering, body pain and sometimes high temperatures.

It comes with goose pimples and shivering; I crave to go under the sun or near the fireplace and body joints weaken. Eyes water due to the extreme headache. Then I know its malaria and I organize to go to the health facility for attention. FGD1 Kitariro.

I become weak and fail to work, come down with a high temperature. However, I wait for one or two days, then on the third day of the onset of the above symptoms, that's when I often go to the health facility. If I go immediately upon the onset of the symptoms, the test will come out negative. FGD1 Kitariro.

On the other hand, some of the participants were able to define malaria as causing change in temperature, headache, backache, diarrhea and body weak-

ness.

I was pregnant around six months when I got a temperature and developed severe headache in the morning. By the time I reached Bwindi Community Hospital, it was 11:00 pm in the night after paying 50,000/= for boda boda. When I arrived, I was told that it was already too late. The doctors did everything to save me. I was injected many times, on the hands and on the leg and I was put on drip. I sweated so much during which time I was told that my babies were coming out. I had a miscarriage and I lost both babies. They were twins. I spent four days in the hospital after that. The pregnancy that I lost was the fifth pregnancy. FGD 2 Kihembe.

I know I have got malaria when I experience backache and high temperature. In addition, I develop diarrhea, and then I become too weak. FGD2 Kihembe.

Other participants were able to contextualize malaria as causing a queasy feeling in their stomach accompanied by vomiting and passing yellow stool, body pain, body weakness especially the joints, dizziness, change in temperatures and fever.

Malaria gives a queasy feeling in the stomach which may be accompanied by passing lose yellow stool and vomiting, then it goes to the head causing extreme shattering pain, weakness in the joints of the hands and feet, shivering and high temperature. FGD 4 Byumba.

3.5. Barriers to Accessing Malaria Treatment

The barriers to accessing treatment at health facilities that most of the respondents shared were long distances, financial and difficult geography.

Distances to health facilities are too far, treacherous across the forest and hilly terrain especially in severe cases that required referral to Bwindi Community Hospital. FGD 1 Kitariro.

Movement from home to the health centre is the biggest challenge due to transport costs. After the onset of malaria, the body is weak and to reach the nearest road to access road transport is also difficult because of hilly and steep terrain. This is difficult for a person already sick from malaria. KII-05.

Some of the participants identified marginalization of the Batwa, favouritism of non-Batwa and poor inaccessible transport network as major barriers to accessing health care services.

We are marginalized by health workers who favor non-Batwa who are given priority over us when at the Bwindi Community Hospital. FGD 5 Kebiremu.

In addition, the drug stock-outs at the health facilities and lack of regular outreach to the community were barriers to accessing health services.

Mobile Clinics stopped, or occur each month and there's nothing in between. So, if malaria strikes, it is a challenge to access treatment quickly. FGD 3 Kitahurira.

Others expressed how they were not able to move to the distant health facilities where it required them to stop over and buy food.

Lack of funds for food while on the way or at the health facility—the fear of moving away from the place of safety where food can be got to one of biting hunger, that's on the way to and from hospital and in case of inpatient stay, during hospital stay is a big challenge. FGD5 Kebiremu.

Some health workers at the health facilities where Batwa access services indicated that Batwa have overtime developed a mentality of entitlement.

Batwa people have an attitude of entitlement. They have a mentality that organizations like Batwa Development Programme and the government should provide them free health services. The Batwa should be empowered to establish sustainable livelihoods like agriculture for food production and crafts to earn income. KII-01.

4. Discussion

This study characterized lived experiences of malaria among the Batwa Indigenous people of Kanungu a rural district in southwestern Uganda. Malaria lived experiences were linked to socio-cultural, economic, and geographic factors. Findings of this study demonstrate Andersen's Behavioural Model of Access to Medical Care which presents and explains health-seeking and accessing health services in terms of *predisposing* factors, *enabling resources*, and *need* factors [27] [43]. The findings are essential in understanding the ways in which Indigenous individuals recognize and manage an illness in the broader context of their everyday lives, in order to better inform contextually and culturally appropriate interventions for Indigenous populations [12] [32].

4.1. Exploring Enabling Resources and Experiences of Treating Malaria

We found that majority of respondents, both Batwa, and non-Batwa, had experienced malaria in their households and believed in using remedies such as herbs prior to accessing malaria treatment from health facilities. This is similar to Indigenous communities in India who knew about malaria from having suffered from it previously, or through discussions with friends, family, or neighbours who had been infected [22]. In Burkina Faso malaria treatment was often reported to be a combination of both scientific and traditional methods. Depending on the type of malaria and its severity, people usually started with some traditional therapy, followed by scientific treatment in case of failure [44]. In Ghana, visiting health facilities after the onset of fever was the second-best option for participants; and it was significantly reported among civil servants and traders, probably because of the financial implications vis-a-vis the relatively higher out-of-pocket expenses compared to registered medicine stores [45] [46] [47]. The choices people make in seeking appropriate care when a family member becomes ill are influenced by the broader social context within which they live. Decisions about where to seek treatment are also influenced by interpretations of severity and cause according to people's experiences [47].

We found out that many Batwa are dependent on traditional medicine as

first-line treatment when ill. This may be because they are renowned for their knowledge of herbal and other traditional treatments for illness, or they lack money to pay for services and they may also experience discrimination [15] [26] [34] [38]. However, use of traditional remedies and inaction to observe the symptoms has been attributed to delays in proper management of malaria leading to complicated, severe and life-threatening episodes especially in children and pregnant women [45] [48] [49]. Malaria control requires an integrated approach including prevention and prompt treatment with effective antimalaria agents [50] [51]. Artemisinin-based combination therapies (ACTs) are the first line treatment for uncomplicated malaria in Uganda [52] [53] but specific interventions may be needed to reach remote at-risk communities and to ensure that they are used appropriately [50] [54]. Participants in this study reported using ACTs like *coartem* either from health facilities, VHTs or from drug shops in the community [22] [44] [54]. However, a major concern from this study was the sharing of malaria medicines by participants from their family members. This practice points to poor adherence to malaria medication and may lead to ineffective dosage, developing severe malaria and drug resistance [22]. It is, therefore, very important that health education in rural settings targets the importance of seeking help promptly and from the right place when ill with symptoms of malaria thus creating an enabling environment for malaria management (see **Figure 2**). Going for a malaria test when there is any febrile illness, to rule out other causes of fever and use medication appropriately is crucial [55].

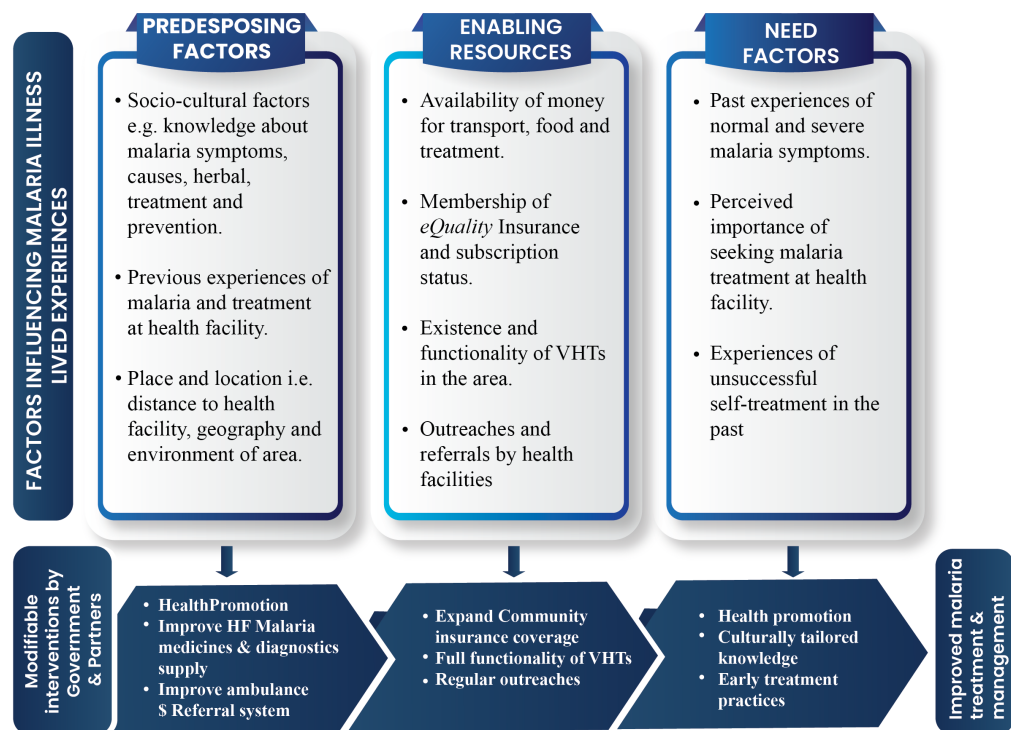


Figure 2. Modifiable predisposing, enabling and need factors associated with malaria illness and accessing healthcare among Batwa, for government and development partners based on Andersen (1995) Access to Medical Care Model (AMCM) and Tesfaye *et al.* (2018).

Our study also showed the grassroots role played by VHTs in creating awareness about malaria control and its management. VHTs are provided with pre-packed ACTs and can administer simple treatment for malaria [56]. Evidence from India with Community Health Workers—CHWs [23] and Cambodia with Village Malaria Workers—VMWs [54] indicated that provision of free diagnosis and treatment through these community-based structures is an effective means of increasing access and coverage especially for marginalized populations.

4.2. Understanding Barriers to Accessing Malaria Treatment

Experience of barriers to malaria treatment are an integral part of issues relating to both the social and cultural determinants of health and how they may hamper Indigenous patients', their families' and communities' from accessing care [12]. Our research revealed multiple barriers faced by Batwa Indigenous people in accessing malaria treatment that included: 1) long distances to health facilities, 2) geographically difficult terrain, 3) economic constraints, 4) lack of regular health outreaches and 5) stockouts of malaria medicines at health facilities.

Many participants in the FGDs and KIIs indicated long distances to health facilities as a major impediment to accessing malaria treatment. This finding on long distances is consistent with an earlier study [32] where participants from most Batwa communities described distance to the health centres as a major determinant and prohibitive to antenatal care attendance (ANC).

Furthermore, geographically difficult terrain comprising of steep hills, wide valleys some occupied by wetlands, swamps and rivers were reported by some respondents to hinder easy movements to and from health facilities for treatment. This was more pronounced during the rainy seasons when the unpaved roads become very difficult to use and some roads and village paths are flooded. Similar evidence of geographical barriers to accessing malaria treatment have been reported among Indigenous communities in India [22] and among Guna Indigenous peoples in Panama [23]. In India, Indigenous communities often live in remote, often heavily forested and rural areas while in Panama geographic isolation, limited access to health services, while poverty and illiteracy are also noted as main problems of accessing health care [22] [23].

Economic constraints comprised another barrier to accessing malaria treatment by Batwa. We found these ranged from inadequate money for transport to and from the health facility, payment for services and food while traveling or when admitted at the health facility. Other studies have noted that costs of transportation and hospital expenses were a barrier [12] [23] [57] [58]. However, where health microinsurance schemes exist covering costs of care at health facilities, hospital expenses were no longer a barrier, leaving transportation as the only concern [57]. Many Ugandans spend substantial out-of-pocket expenses in seeking health care, especially for recurrent diseases like malaria [59]; thus, the poor and those without adequate finances (like the Batwa) are forced to seek cheaper alternative treatments, such as herbal remedies [60]. Similar to Batwa

IPs, in Nigeria households in rural areas suffer a series of deprivations with respect to access to the basic necessities of life including health care [61] [62] [63]. This finding has implications for policy, especially regarding establishing universal health coverage through community or national health insurance schemes to reduce financial vulnerability of households and improve health seeking behaviour—including the use of preventive measures for malaria [64] [65].

We found out that Batwa were used to tailored mobile clinics and outreaches from BCH to access services for malaria (Figure 2). However, mobile clinics stopped and outreaches were now irregular—only once a month. Yet, community outreach in malaria hotspots with screening and treatment to supplement health facilities drastically reduces cases like it has been reported in Kisoro district in Uganda [52]. We therefore recommend consistent regular outreaches, especially in remote isolated areas where access to healthcare is limited. Alternatively, the government and partners in malaria control should ensure that VHTs have regular supplies to provide the first line of malaria treatment and other common diseases (Figure 2).

Another group of participants mentioned stockouts of malaria medicines as an impediment to treatment. The key causes of medical stockouts in Uganda are poor planning, prioritization and weak tracking system. Non-availability of certain types of supplies (e.g., malaria ACTs and diagnostics) at a particular time may directly translate into loss of lives and undermine the health system [65]. To this end, the government and development partners should ensure proper quantification and consistent supply of malaria medicines and diagnostics at all levels (Figure 2).

4.3. Scrutinizing the Predisposing and Need Factors

Need factors are the most immediate cause of health service use and reflect the perceived health status of the individual [27]. Our study proved that Batwa can clearly identify the symptoms of malaria from the onset of an episode. They ably described the symptoms of malaria based on their experiences of the illness and local context. This is consistent with other studies [43] [44] [50]. We found out that the knowledge of symptoms, and the severity of malaria are enablers for seeking treatment. Contrary to this finding, some Indigenous communities in India lacked knowledge regarding malaria symptoms and transmission [22]. Other published previous studies; found that 42.2% of the study population and up to 18.2% who attended university did not know a symptom of malaria [66]. Yet, knowing and being able to characterize the symptoms of malaria is a very important step since it can induce other actions related to management of the illness. For instance, fever is usually a common malaria symptom that triggers the decision to seek care compared to other symptoms [67]. Ability of the ill person to recognize symptoms and communicate them to the professionals is a crucial first step [68]. Caution should however be taken that the symptoms of malaria are non-specific. Malaria is suspected clinically primarily on the basis of

fever or a history of fever. There is no combination of signs and symptoms that reliably distinguishes malaria from other causes of fever (e.g., febrile illness); diagnosis based only on clinical features has very low specificity and results in overtreatment. Therefore, malaria diagnosis should aim to identify patients who truly have malaria (using malaria rapid diagnostic tests mRDTs and microscopy) to guide rational use of antimalaria medicines [50] [55].

People in different societies hold a variety of beliefs about the cause and transmission of malaria that vary according to cultural, educational, and economic factors, and have direct consequences for both preventive and treatment-seeking behaviour and activities to control malaria [69]. Following on this, we found divergent views on what causes malaria among Batwa, but the understandings were largely consistent with scientific perspectives, therefore highlighting Batwa's knowledge about malaria. These findings are consistent with other studies that discovered diversity in explanation as to whether it is simply the presence of mosquitoes or their bite specifically that transmits infection among rural farmers in Burkina Faso, Indigenous communities in India and Batwa in Kanungu district respectively [22] [31] [44]. Similarly, regarding malaria prevention, a variety of prevention methods were mentioned by participants. This finding is in conformity with studies where IPs were familiar with scientific approaches to disease prevention [13] [22]. Therefore, this research provides a good baseline for government and stakeholders involved in malaria control especially in rural settings to strengthen health promotion towards malaria prevention and control.

A major concern from this study relates to availability and use of mosquito nets. Nets were inadequate to cover all members of the households. Other responses indicated nets had been damaged and no longer served their purpose. Some studies have shown a significant relationship between ownership of LLINs and malaria prevalence, with malaria rates being lowest shortly after targeted distribution of LLINs [30]. Still, the poorest and most marginalized populations, notably IPs, may still be disadvantaged from ownership and use of LLINs compared to general Uganda population [70]. This suggests that high malaria prevalence among Batwa may be partly a result of poor LLINs coverage. Based on this result we recommend that government and partners should develop affirmative action in malaria interventions for IPs.

4.4. Limitations of This Study

Limitations of this study may include the following: Only 5 of the 10 Batwa IPs settlements were purposively selected for this study leaving out another 5 which could have left out some malaria lived experiences from these communities. However, the inclusion criteria based on those experiencing high malaria burden, distance to health facilities, and physical factors like elevation and natural vegetation cover were considered to bring out a rich mix of experiences. It is also noteworthy that Batwa IPs are a relatively homogeneous community, meaning that the 05 settlements are very representative. Nonetheless, further studies cov-

ering all settlements could be undertaken in future to capture more insights on malaria. An additional limitation could be potential for social desirability bias [71] whereby positive responses would be related to participants desire to please the researchers and with some expectations. However, all participants were asked to share their experiences truthfully and without bias and expectations.

5. Conclusion and Recommendations

This study characterized and highlighted Batwa's malaria illness lived experiences and access to healthcare in a rural remote setting. These experiences are essential in appreciating the ways in which Indigenous populations understand and manage common illnesses in contexts where they may be marginalised and how appropriate policies and interventions can be developed [12]. Andersen's Behavioural and Access to Medical Care Model [27] clearly enabled an understanding of the access to malaria treatment by Indigenous population and the associated malaria predisposing, enabling and need experiences (Figure 2). We recommend focused interventions including: increased health education through VHTs and health outreaches [22] [54] [56] targeting malaria early diagnosis and treatment, ensuring adequate medical supplies at health facilities, and tailored distribution involving community sensitization on operation and maintenance of ITNs to vulnerable populations [66]. Furthermore, community insurance should be extended to all to avert catastrophic out-of-pocket expenditures [45] [58] [59] [72] which are a key barrier to access. This is in line with the Uganda health sector goal of achieving universal health coverage for all including IPs [64]. With the preference of traditional herbal medicine highly exhibited in the Batwa lived experiences, government and its partners should work with the Batwa to document and integrate herbal medicines in malaria management.

Data Sharing Statement

Datasets used in this manuscript e.g., the FGDs & KII transcripts and the *Atlas.ti* analysis are available from the corresponding author upon reasonable request.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Lindblade, K.A., Hong, L.X., Tiffany, A., *et al.* (2021) Supporting Countries to Achieve Their Malaria Elimination Goals: the WHO E-2020 Initiative. *Malaria Journal*, **20**, Article No. 481. <https://doi.org/10.1186/s12936-021-03998-3>
- [2] World Health Organization (2021) World Malaria Report 2021.
- [3] Mswati, I.K. (2019) An Africa Free of Malaria. *The Lancet*, **394**, 988-989. [https://doi.org/10.1016/S0140-6736\(19\)31952-X](https://doi.org/10.1016/S0140-6736(19)31952-X)
- [4] Tarekegn, M., Tekie, H., Dugassa, S. and Wolde-Hawariat, Y. (2021) Malaria Prevalence and Associated Risk Factors in Dembiya District, North-Western Ethiopia. *Malaria Journal*, **20**, Article No. 372. <https://doi.org/10.1186/s12936-021-03906-9>
- [5] Donnelly, B., Berrang-Ford, L., Labbé, J., *et al.* (2016) *Plasmodium falciparum* Malaria Parasitaemia among Indigenous Batwa and Non-Indigenous Communities of Kanungu District, Uganda. *Malaria Journal*, **15**, Article No. 254. <https://doi.org/10.1186/s12936-016-1299-1>
- [6] Messina, J.P., Taylor, S.M., Meshnick, S.R., *et al.* (2011) Population, Behavioural and Environmental Drivers of Malaria Prevalence in the Democratic Republic of Congo. *Malaria Journal*, **10**, Article No. 161. <https://doi.org/10.1186/1475-2875-10-161>
- [7] World Health Organization (2023) Malaria Fact Sheet. <https://www.who.int/news-room/fact-sheets/detail/malaria>
- [8] Ministry of Health (2020) Uganda Clinical Guidelines: National Guidelines on the Management of Common Conditions. https://health.go.ug/sites/default/files/Uganda%20Clinical%20Guidelines%202016_FINAL.pdf
- [9] World Health Organization (2023) WHO Guidelines for Malaria. <https://www.who.int/publications/i/item/guidelines-for-malaria>
- [10] Nyeko, R., Otim, F., Obiye, E.M. and Abala, C. (2023) Anti-Malarial Drug Use, Appropriateness and Associated Factors among Children Under-Five with Febrile Illnesses Presenting to a Tertiary Health Facility: A Cross Sectional Study. *Malaria Journal*, **22**, Article No. 103. <https://doi.org/10.1186/s12936-023-04534-1>
- [11] Ministry of Health (2020) Overview of Malaria in Uganda 2014-2020. <http://library.health.go.ug/sites/default/files/resources/The%20Uganda%20Malaria%20Reduction%20Strategic%20Plan%202014-2020.pdf>
- [12] Davy, C., Harfield, S., McArthur, A., Munn, Z. and Brown, A. (2016) Access to Primary Health Care Services for Indigenous Peoples: A Framework Synthesis. *International Journal for Equity in Health*, **15**, Article No. 163. <https://doi.org/10.1186/s12939-016-0450-5>
- [13] Baxerres, C. and Hesran, J.Y.L. (2020) Family Malaria Management in Africa: At the Crossroads of Social Epidemiology and Medical Anthropology. In: Petit, V., Qureshi, K., Charbit, Y. and Kreager, P., Eds., *The Anthropological Demography of Health*, Oxford University Press, Oxford, 371-392. <https://doi.org/10.1093/oso/9780198862437.003.0014>
- [14] Gracey, M. and King, M. (2009) Indigenous Health Part 1: Determinants and Disease Patterns. *The Lancet*, **374**, 65-75. [https://doi.org/10.1016/S0140-6736\(09\)60914-4](https://doi.org/10.1016/S0140-6736(09)60914-4)
- [15] Ohenjo, N., Willis, R., Jackson, D., Nettleton, C., Good, K. and Mugarura, B. (2006) Health of Indigenous People in Africa. *The Lancet*, **367**, 1937-1946. [https://doi.org/10.1016/S0140-6736\(06\)68849-1](https://doi.org/10.1016/S0140-6736(06)68849-1)

- [16] Kipsiesey, G. (2008) Integrating Indigenous and Modern Knowledge of Malaria among the Sabaot of Mount Elgon in Western Kenya. <https://www.sil.org/resources/archives/54785>
- [17] Smylie, J., Kaplan-Myrth, N., McShane, K., Métis Nation of Ontario-Ottawa Council, Piikwanagan First Nation and Tungasuvvingat Inuit Family Resource Centre (2009) Indigenous Knowledge Translation: Baseline Findings in a Qualitative Study of the Pathways of Health Knowledge in Three Indigenous Communities in Canada. *Health Promotion Practice*, **10**, 436-446. <https://doi.org/10.1177/1524839907307993>
- [18] Stephens, C., Nettleton, C., Porter, J., Willis, R. and Clark, S. (2005) Indigenous Peoples' Health—Why Are They behind Everyone, Everywhere? *The Lancet*, **366**, 10-13. [https://doi.org/10.1016/S0140-6736\(05\)66801-8](https://doi.org/10.1016/S0140-6736(05)66801-8)
- [19] Gruen, R.L. (2002) Outreach and Improved Access to Specialist Services for Indigenous People in Remote Australia: The Requirements for Sustainability. *Journal of Epidemiology and Community Health*, **56**, 517-521. <https://doi.org/10.1136/jech.56.7.517>
- [20] United Nations (2021) State of the World's Indigenous Peoples: Rights to Lands, Territories and Resources.
- [21] African Commission on Human and Peoples' Rights and International Work Group for Indigenous Affairs (2005) Report of the African Commission Group of Experts on Indigenous Populations/Communities.
- [22] Sundararajan, R., Kalkonde, Y., Gokhale, C., Greenough, P.G. and Bang, A. (2013) Barriers to Malaria Control among Marginalized Tribal Communities: A Qualitative Study. *PLOS ONE*, **8**, e81966. <https://doi.org/10.1371/journal.pone.0081966>
- [23] Cáceres, L., Calzada, J.E., Gabster, A., *et al.* (2017) Social Representations of Malaria in the Guna Indigenous Population of Comarca Guna de Madungandi, Panama. *Malaria Journal*, **16**, Article No. 256. <https://doi.org/10.1186/s12936-017-1899-4>
- [24] Lwasa, S., Ford, J.D., Berrang-Ford, L., Namanya, D.B., Buyinza, A. and Nabaasa, B. (2019) Resilience to Climate Change in Uganda: Policy Implications for Two Marginalized Societies. In: Mason, L.R. and Rigg, J., Eds., *People and Climate Change*, Oxford University Press, Oxford, 149-164. <https://doi.org/10.1093/oso/9780190886455.003.0008>
- [25] Berrang-Ford, L., Dingle, K., Ford, J.D., *et al.* (2012) Vulnerability of Indigenous Health to Climate Change: A Case Study of Uganda's Batwa Pygmies. *Social Science & Medicine*, **75**, 1067-1077. <https://doi.org/10.1016/j.socscimed.2012.04.016>
- [26] Lewis, J. (2000) The Batwa Pygmies of the Great Lakes Region. <https://minorityrights.org/wp-content/uploads/old-site-downloads/download-150-Batwa-Pygmyes-of-the-Great-Lakes-Region.pdf>
- [27] Andersen, R.M. (1995) Revisiting the Behavioral Model and Access to Medical Care: Does It Matter? *Journal of Health and Social Behavior*, **36**, 1-10. <https://doi.org/10.2307/2137284>
- [28] Castleden, H., Garvin, T. and First Nation, H. (2008) Modifying Photovoice for Community-Based Participatory Indigenous Research. *Social Science & Medicine*, **66**, 1393-1405. <https://doi.org/10.1016/j.socscimed.2007.11.030>
- [29] Harper, S.L., Harper, S.L., Edge, V.L. and Cunsolo Willox, A. (2012) 'Changing Climate, Changing Health, Changing Stories' Profile: Using an EcoHealth Approach to Explore Impacts of Climate Change on Inuit Health. *EcoHealth*, **9**, 89-101. <https://doi.org/10.1007/s10393-012-0762-x>
- [30] Indigenous Health Adaptation to Climate Change Research Team (2015) IHACC Uganda Summary of Emerging Results 2015.

- [31] Clark, S., Berrang-Ford, L., Lwasa, S., *et al.* (2016) A Longitudinal Analysis of Mosquito Net Ownership and Use in an Indigenous Batwa Population after a Targeted Distribution. *PLOS ONE*, **11**, e0154808. <https://doi.org/10.1371/journal.pone.0154808>
- [32] Patterson, K., Clark, S., Berrang-Ford, L., *et al.* (2020) Acute Gastrointestinal Illness in an African Indigenous Population: The Lived Experience of Uganda's Batwa. *Rural and Remote Health*, **20**, Article 5141. <https://doi.org/10.22605/RRH5141>
- [33] Tenny, S., Brannan, J.M. and Brannan, G.D. (2022) Qualitative Study. StatPearls. <http://www.ncbi.nlm.nih.gov/books/NBK470395/>
- [34] Namanya, D.B. (2013) Malaria Risk Factors Facing Uganda's Batwa Population. Africa Portal. <https://www.africaportal.org/publications/malaria-risk-factors-facing-ugandas-batwa-population/>
- [35] Clark, S., Berrang-Ford, L., Lwasa, S., *et al.* (2015) The Burden and Determinants of Self-Reported Acute Gastrointestinal Illness in an Indigenous Batwa Pygmy Population in Southwestern Uganda. *Epidemiology and Infection*, **143**, 2287-2298. <https://doi.org/10.1017/S0950268814003124>
- [36] Kulkarni, M.A., Garrod, G., Berrang-Ford, L., *et al.* (2017) Examination of Antibody Responses as a Measure of Exposure to Malaria in the Indigenous Batwa and Their Non-Indigenous Neighbors in Southwestern Uganda. *The American Journal of Tropical Medicine and Hygiene*, **96**, 330-334. <https://doi.org/10.4269/ajtmh.16-0559>
- [37] Kilama, M., Smith, D.L., Hutchinson, R., *et al.* (2014) Estimating the Annual Entomological Inoculation Rate for *Plasmodium falciparum* Transmitted by *Anopheles gambiae* S.L. Using Three Sampling Methods in Three Sites in Uganda. *Malaria Journal*, **13**, Article No. 111. <https://doi.org/10.1186/1475-2875-13-111>
- [38] Steele, V., Patterson, K., Berrang-Ford, L., *et al.* (2021) Factors Influencing Antenatal Care Attendance for Bakiga and Indigenous Batwa Women in Kanungu District, Southwestern Uganda. *Rural Remote Health*, **21**, Article 6510. <https://doi.org/10.22605/RRH6510>
- [39] Indigenous Health Adaptation to Climate Change Research Team (2014) Indigenous Health Adaptation to Climate Change 2014 Emerging Results.
- [40] Krippendorff, K. (2004) Content Analysis: An Introduction to Its Methodology. 2nd Edition, Sage, New Castle.
- [41] Smith, B. (2002) *Atlas.ti* for Qualitative Data Analysis, Perspectives in Education. *Perspectives in Education*, **20**, 65-76. <https://hdl.handle.net/10520/EJC87147>
- [42] Soratto, J., Pires, D.E.P. and de Friese, S. (2020) Thematic Content Analysis Using ATLAS.ti Software: Potentialities for Researchs in Health. *Revista Brasileira de Enfermagem*, **73**, e20190250. <https://doi.org/10.1590/0034-7167-2019-0250>
- [43] Tesfaye, G., Chojenta, C., Smith, R. and Loxton, D. (2018) Application of the Andersen-Newman Model of Health Care Utilization to Understand Antenatal Care Use in Kersa District, Eastern Ethiopia. *PLOS ONE*, **13**, e0208729. <https://doi.org/10.1371/journal.pone.0208729>
- [44] Okrah, J., Traoré, C., Palé, A., Sommerfeld, J. and Müller, O. (2002) Community Factors Associated with Malaria Prevention by Mosquito Nets: An Exploratory Study in Rural Burkina Faso. *Tropical Medicine & International Health*, **7**, 240-248. <https://doi.org/10.1046/j.1365-3156.2002.00856.x>
- [45] Orish, V.N., Maalman, R.S.E., Donkor, O.Y., *et al.* (2021) Assessing Health-Seeking Behaviour and Malaria Prevention Practices among Communities in Four Districts

- of the Volta Region of Ghana. *Malaria Journal*, **20**, Article No. 450. <https://doi.org/10.1186/s12936-021-03986-7>
- [46] Berendes, S., Adeyemi, O., Oladele, E.A., Oresanya, O.B., Okoh, F. and Valadez, J.J. (2012) Are Patent Medicine Vendors Effective Agents in Malaria Control? Using Lot Quality Assurance Sampling to Assess Quality of Practice in Jigawa, Nigeria. *PLOS ONE*, **7**, e44775. <https://doi.org/10.1371/journal.pone.0044775>
- [47] Desmond, N., Prost, A. and Wight, D. (2012) Managing Risk through Treatment-Seeking in Rural North-Western Tanzania: Categorising Health Problems as Malaria and *Nzoka*. *Health, Risk & Society*, **14**, 149-170. <https://doi.org/10.1080/13698575.2012.661042>
- [48] Kamat, V.R. (2006) "I Thought It Was Only Ordinary Fever!" Cultural Knowledge and the Micropolitics of Therapy Seeking for Childhood Febrile Illness in Tanzania. *Social Science & Medicine*, **62**, 2945-2959. <https://doi.org/10.1016/j.socscimed.2005.11.042>
- [49] Adibe, M.O., Ayogu, E.E. and Igboeli, N.U. (2016) Assessment of Knowledge and Roles of Patent Medicine Vendors in the Implementation of National Malaria Treatment Policy in Nigeria. *World Journal of Pharmaceutical Sciences*, **4**, 310-317.
- [50] World Health Organization (2015) Guidelines for the Treatment of Malaria, 3rd Edition. <https://apps.who.int/iris/handle/10665/162441>
- [51] Musoke, D., Karani, G., Ssempebwa, J., Etajak, S., Guwatudde, D. and Musoke, M. (2015) Knowledge and Practices on Malaria Prevention in Two Rural Communities in Wakiso District, Uganda. *African Health Sciences*, **15**, 401-412. <https://doi.org/10.4314/ahs.v15i2.13>
- [52] Yeka, A., Gasasira, A., Mpimbaza, A., *et al.* (2012) Malaria in Uganda: Challenges to Control on the Long Road to Elimination: I. Epidemiology and Current Control Efforts. *Acta Tropica*, **121**, 184-195. <https://doi.org/10.1016/j.actatropica.2011.03.004>
- [53] Ministry of Health (2019) Surveillance Monitoring & Evaluation Unit National Malaria Annual Report 2017-2018.
- [54] Yeung, S., Van Damme, W., Socheat, D., White, N.J. and Mills, A. (2008) Access to Artemisinin Combination Therapy for Malaria in Remote Areas of Cambodia. *Malaria Journal*, **7**, Article No. 96. <https://doi.org/10.1186/1475-2875-7-96>
- [55] Adhikari, B., Phommasone, K., Pongvongsa, T., *et al.* (2019) Treatment-Seeking Behaviour for Febrile Illnesses and Its Implications for Malaria Control and Elimination in Savannakhet Province, Lao PDR (Laos): A Mixed Method Study. *BMC Health Services Research*, **19**, Article No. 252. <https://doi.org/10.1186/s12913-019-4070-9>
- [56] Ministry of Health (2008) Village Health Team Guide for Training the Trainers of Village Health Teams.
- [57] Blanchard-Horan, C. (2007) Health Microinsurance in Uganda: Affecting Malaria Treatment Seeking Behavior. *International Journal of Public Administration*, **30**, 765-789. <https://doi.org/10.1080/01900690701226646>
- [58] Urama, C.E., Manasseh, C.O., Ukwueze, E.R. and Ogbuabor, J.E. (2021) Choices and Determinants of Malaria Treatment Seeking Behaviour by Rural Households in Enugu State, South-East Nigeria. *International Journal of Health Promotion and Education*, **59**, 156-173. <https://doi.org/10.1080/14635240.2020.1730703>
- [59] Nabyonga Orem, J., Mugisha, F., Okui, A.P., Musango, L. and Kirigia, J.M. (2013) Health Care Seeking Patterns and Determinants of Out-of-Pocket Expenditure for Malaria for the Children Under-Five in Uganda. *Malaria Journal*, **12**, Article No. 175.

- <https://doi.org/10.1186/1475-2875-12-175>
- [60] Dalaba, M.A., Welaga, P., Oduro, A., Danchaka, L.L. and Matsubara, C. (2018) Cost of Malaria Treatment and Health Seeking Behaviour of Children Under-Five Years in the Upper West Region of Ghana. *PLOS ONE*, **13**, e0195533. <https://doi.org/10.1371/journal.pone.0195533>
- [61] Omonona, B.T., Obisesan, A.A. and Aromolaran, O.A. (2015) Health-Care Access and Utilization among Rural Households in Nigeria. *Journal of Development and Agricultural Economics*, **7**, 195-203. <https://doi.org/10.5897/JDAE2014.0620>
- [62] Oladipo, J. (2014) Utilization of Health Care Services in Rural and Urban Areas: A Determinant Factor in Planning and Managing Health Care Delivery Systems. *African Health Sciences*, **14**, 322-333. <https://doi.org/10.4314/ahs.v14i2.6>
- [63] Onwujekwe, O., Hanson, K., Uzochukwu, B., Ichoku, H., Ike, E. and Onwughalu, B. (2009) Are Malaria Treatment Expenditures Catastrophic to Different Socio-Economic and Geographic Groups and How Do They Cope with Payment? A Study in Southeast Nigeria. *Tropical Medicine & International Health*, **15**, 18-25. <https://doi.org/10.1111/j.1365-3156.2009.02418.x>
- [64] Ministry of Health (2020) A Roadmap towards Universal Health Coverage in Uganda 2020/21 to 2029/30.
- [65] Ministry of Finance Planning and Economic Development (2015) Continuous Stock-Outs of Medical Supplies in Uganda: What Are the Root Causes?
- [66] Kangmo Sielinou, C.B., Anong, D., Cumber, S.N., Yumumkah Cumber, R. and Nkuo-Akenji, T. (2020) Knowledge, Attitudes and Perceptions Regarding Malaria: A Cross-Sectional Study in Pregnant Women Attending Antenatal Care in the New-Bell District Hospital, Douala, Cameroon. *The Pan African Medical Journal*, **36**, Article 207. <https://doi.org/10.11604/pamj.2020.36.207.16180>
- [67] Atkinson, J.A.M., Fitzgerald, L., Toaliu, H., *et al.* (2010) Community Participation for Malaria Elimination in Tafea Province, Vanuatu: Part I. Maintaining Motivation for Prevention Practices in the Context of Disappearing Disease. *Malaria Journal*, **9**, Article No. 93. <https://doi.org/10.1186/1475-2875-9-93>
- [68] Lee, J.L.J., Wolch, J. and Walsh, J. (1998) Homeless Health and Service Needs. In: Kearns, R.A. and Gesler, W.M., Eds., *Putting Health into Place: Landscape, Identity, and Well-Being*, Syracuse University Press, New York, 120-142.
- [69] Heggenhougen, K., Hackeltha, V., Vivek, P., United Nations Development Programme, World Bank and World Health Organization (2003) The Behavioural and Social Aspects of Malaria and Its Control.
- [70] Uganda National Malaria Control Division (NMCD), Uganda Bureau of Statistics (UBOS) and International Coaching Federation (ICF) (2020) Uganda Malaria Indicator Survey 2018-2019.
- [71] Voorhees, J., Bailey, S., Waterman, H. and Checkland, K. (2022) Accessing Primary Care and the Importance of 'Human Fit': A Qualitative Participatory Case Study. *British Journal of General Practice*, **72**, e342-e350. <https://doi.org/10.3399/BJGP.2021.0375>
- [72] Latunji, O.O. and Akinyemi, O.O. (2018) Factors Influencing Health-Seeking Behaviour among Civil Servants in Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, **16**, 52-60.