



J.C. FLOWERS
FOUNDATION



Assessing malaria-related knowledge, attitudes, and practices among community members within the program areas of the Isdell:Flowers Cross Border Malaria Initiative

Results from 2023 KAP Survey within the program areas of

**Trans Kunene Malaria Initiative /
Isdell:Flowers Cross Border Malaria Initiative**

Of the

**Namibia Anglican Community Development Organization
(NACDO)**

Data collected between 2 May – 27 June 2023

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Abbreviations

CHW	community health worker
CMV	community malaria volunteer
HH	household
IFCBMI	Isdell:Flowers Cross Border Malaria Initiative
IRS	indoor residual spraying
ITN	insecticide treated net
KAP	knowledge, attitudes, and practices
LLINs	long lasting insecticidal nets
MoHSS	Ministry of Health and Social Services
NVDCP	National Vector-borne Disease Control Program
SBCC	social and behavioural change communication
TKMI	Trans Kunene Malaria Initiative

Section 1. Executive Summary

The Namibia Anglican Community Development Organization (NACDO) implements the Isdell:Flowers Cross Border Malaria Initiative through the Trans Kunene Malaria Initiative (herein referred to as “TKMI / Isdell:Flowers”), which facilitates community engagement for malaria elimination in select communities in select border communities in Ohangwena Region, in partnership with the National Vector-borne Disease Control Programme (NVDCP) of the Namibian Ministry of Health and Social Services (MoHSS) and funded by the J.C. Flowers Foundation. This study was conducted to understand malaria-related knowledge, attitudes, and practices (“KAP”) within program areas. The overall goal is to inform programmatic decisions based on local and recently collected data. The study’s main areas of inquiry are: ownership of, access to, and use of insecticide treated nets (ITNs); indoor residual spraying (IRS) household coverage within 12 months prior to the survey; patterns of care-seeking behaviour among children under five years with fever in the previous two weeks; knowledge of malaria symptoms and cause; and attitudes towards ITNs and IRS. This report presents key findings from the 2023 KAP Survey and select results from the 2020-2022 KAP Surveys for comparison. Results are representative of TKMI / Isdell:Flowers program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels since TKMI / Isdell:Flowers program areas do not cover these administrative units in their entirety. However, these results can shed important light on the realities of malaria in these administrative units. A full listing of program areas included in the survey’s sampling frame can be found in Appendix 1. Below is a summary of the key 2023 KAP Survey Results:

Insecticide treated nets (ITNs)

Across all TKMI / Isdell:Flowers program areas, all key ITN indicators – household ownership of ITNs, access to ITNs (assuming each ITN covers two people), and use of ITNs the previous night – decreased significantly between 2022-2023 ($p < 0.001$). In 2023, 52% of households own at least one ITN but only 18% of households own at least one ITN for every two people in the household. Pregnant women and children <5 had low previous-night ITN coverage (34% and 38%, respectively), but used ITNs at higher levels than the general population (27%), indicating that in many cases these higher-risk groups are correctly being prioritized to sleep under ITNs when there are not enough ITNs in the household to cover everyone. Most people who *did* have access to an ITN, however, slept under it the previous night, though there is still room for improvement. While only 27% of people used an ITN the previous night across all surveyed households regardless of ITN ownership, 78% of people used an ITN among households that own at least one ITN in good condition for every two people in the household. This suggests that the lack of access to ITNs is a main driver of their use, and that most people would use an ITN if they have one.

Indoor residual spraying (IRS)

The World Health Organization (WHO) recommends that $\geq 85\%$ of households within a targeted area receive IRS in order for IRS to be most effective. Across all TKMI / Isdell:Flowers program areas that were targeted to receive IRS within 12 months prior to the 2023 KAP Survey, 66% of households received IRS within the past 12 months. Among households that reportedly did not receive IRS, the most common reason given for not receiving IRS was “no one came to my household to offer IRS” (77%).

Care-seeking behavior for children under age five (<5) with fever

There are several key steps in the ideal trajectory of care for children under five years (<5) with fever: go to a health facility or community health worker (CHW) and do so within 24 hours of fever onset, receive a malaria test, receive treatment if positive for malaria, and take the full course of the medication. Each step in the trajectory of care presents an opportunity for children to be “missed” and, therefore, for possible malaria infections to be left undiagnosed or untreated. The steps in the trajectory of care depend on both individual behavior and availability of health services. The largest gaps in the care seeking trajectory are seeking care for the fever and doing so within 24 hours of the onset of the fever; 68% of children <5 with fever in the past two weeks sought care from a health facility or CHW within 24 hours of fever onset. 53% of children <5 with fever in the past two weeks received a malaria test, among those who sought care from a health facility or CHW.

Knowledge and attitudes

Respondents were asked questions pertaining to their knowledge of malaria symptoms and cause. The percent of respondents who correctly identified “fever/chills” as a symptom of malaria increased significantly from 83% in 2022 to 88% in 2023 ($p < 0.001$); however, there is still room for continued improvement in correctly identifying fever as a symptom of malaria. The percent of respondents who believed that it was possible to be infected with malaria without having symptoms also increased significantly from 68% in 2022 to 79% in 2023 ($p < 0.001$). There is also still room for improvement in knowledge of asymptomatic/low-density malaria infections, especially as Namibia moves closer toward the goal of malaria elimination when low-density malaria infections make up an increasingly larger portion of overall malaria infections which can contribute to a persistent malaria reservoir if those cases are not detected and treated. Knowledge levels of mosquito as the cause of malaria and that malaria infections can be deadly if left untreated are very high (96% and 98%, respectively).

Section 2. Background

The Namibia Anglican Community Development Organization (NACDO) implements the Isdell:Flowers Cross Border Malaria Initiative through the Trans Kunene Malaria Initiative (herein referred to as “TKMI / Isdell:Flowers”), which facilitates community engagement for malaria elimination in select communities in select border communities in Ohangwena Region, in partnership with the National Vector-borne Disease Control Programme (NVDCP) of the Namibian Ministry of Health and Social Services (MoHSS) and funded by the J.C. Flowers Foundation. TKMI / Isdell:Flowers operates on the principle that malaria can be eliminated only if those most affected have the knowledge, skills, and resources to prevent and treat the disease and to advocate for its elimination.

The program supports a network of approximately 168 community malaria volunteers (CMV) and 33 community health workers (CHWs) who deliver malaria education and prevention services within their communities. Religious leaders, teachers, and other influential community leaders support the efforts of this cadre and deliver malaria education within churches, schools, and the community as a whole.

IFCBMI received approval from the Research Ethics Unit of the MoHSS of Namibia to conduct this study to gain a better understanding of malaria-related knowledge, attitudes, and practices (“KAP”) among community members living within TKMI / Isdell:Flowers program areas. This study has three main areas of inquiry:

- 1) Knowledge: assess knowledge of the cause of malaria and its symptoms
- 2) Attitudes: understand attitudes toward ITNs and IRS
- 3) Practices: measure the reported ownership of, access, to and use of insecticide treated nets (ITNs) the night before the survey; reported household indoor residual spraying (IRS) coverage within 12 months prior to the survey; and the reported trajectory of care for children under five years with fever in the two weeks prior to the survey

The overall goal of this study is to improve programmatic decision-making and strategic action based on local and recently collected data. Data collected in the KAP study will also highlight opportunities to collaborate across borders with other Isdell:Flowers program areas in Angola, Zambia, and Zimbabwe. Study findings will be shared with the NVDCP of the MoHSS of Namibia and the academic community to contribute to the body of knowledge on malaria in these communities in Namibia.

This document presents key results from the 2023 KAP Survey, with select results from the 2022 KAP Survey for comparison. Results are representative of TKMI / Isdell:Flowers program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels, since program areas do not cover these administrative units in their entirety. However, these results can shed important light on the realities of malaria within these administrative units. A full listing of the TKMI / Isdell:Flowers program areas included in the 2023 KAP Survey sampling frame can be found in Appendix 1.

Additional information about methodology, statistical analysis, and additional indicators can be available upon request.

Section 3. Methodology

Sampling frame and sample size

The sampling frame for the 2023 KAP Survey included most TKMI / Isdell:Flowers program areas in Namibia (Appendix 1). The 2023 sample size was determined to be a minimum of 2400 households, based on power calculations intending to achieve at least 80% power to detect annual incremental improvements in the following primary outcome measures: the proportion of households that had one unused ITN and also at least one uncovered person the night before the survey, and the proportion of children <5 with fever in the prior two weeks who sought care from a health facility or CHW and did so within 24 hours of fever onset. Sample sizes for KAP Surveys of previous years were calculated in the same manner. Table 1 shows sample sizes from 2022-2023 KAP Surveys and Table 2 shows dates of data collection.

Table 1. Namibia KAP Survey sample sizes (2022-2023 KAP Surveys)

Region	Constituency	Sample sizes	
		2022	2023
Ohangwena	Ongenga	488	874
	Oshikango	285	497
	Okongo	250	881
	Oshikunde	72	199
Omusati	Etayi*	460	-
	Outapi*	624	-
TOTAL		1857	2451
Response rate		100%	100%

*TKMI / Isdell:Flowers “graduated” these areas from their malaria program after the 2022 KAP Survey and thus the KAP Survey was not conducted in these areas in 2023

Table 2. Dates of KAP Survey data collection (2022-2023 KAP Surveys)

Year	Dates of data collection
2022	12 April – 24 May
2023	2 May – 27 June

Household selection

Households were sampled by systematic random sampling. A “skip pattern” was calculated such that for a sampling frame of H households comprising TKMI / Isdell:Flowers program areas, of which X are to be sampled, each ‘(H/X)-1’ household was surveyed until X households were reached. The first household surveyed in every village was selected randomly by drawing a number ‘N’ ranging from 1-10 and surveying the household that was ‘N’ households away from the starting point, which was always the headman’s household.

Survey respondents

All survey participants were required to be female, 18 years old or older, and provide verbal consent. If a household selected for the survey included more than one eligible woman, preference was given to the mother or caregiver of the youngest child in the household. Women were surveyed because they are typically the main caregivers of children under five (<5) and therefore are most likely to answer questions about care-seeking behaviour for their children accurately.

Data analysis

Descriptive statistics were calculated for all indicators. Descriptive statistics weighted each household to account for its inverse probability of being included in the sample. Statistical tests were conducted to compare findings between 2022 and 2023 survey years. Differences in outcomes that are dichotomous at the individual household level were tested for significance using a regression of the outcome on an indicator for survey year. Differences in outcomes expressed as continuous percentages at the individual household level were tested with a linear regression of the outcome on an indicator for the survey year. The significance threshold was set at .05. Data was analyzed in STATA v 14.2.

Section 4. Results

Results are representative of TKMI / Isdell:Flowers program areas only and cannot be directly extrapolated to the Constituency, Regional, or National levels, since program areas do not cover these administrative units in their entirety. However, these results can shed important light on the realities of malaria within these administrative units.

Most tables and graphs show results from the 2023 KAP Survey only, but some show results comparing 2022 and 2023 KAP Survey results (the results of which include data from areas that were surveyed in both years). Statistically significant changes are denoted by bold typeface.

Table 3. Background characteristics, among all program areas (2023 KAP Survey)

Background characteristic	
Average age of respondent (n)	41
Households with at least one child under 5 who slept there the previous night (%)	83%
Average number of children <5 in household the previous night, among households with at least one child <5 (n)	2.0
Households with at least one pregnant woman who slept there the previous night (%)	10%
Average number of people who slept in the household the prior night (n)	6.9
Average number of sleeping spaces (n)	5.4
Households with surrounding standing water, per visual observation of data collector (%)	15%

Table 4. Respondent education level, among all program areas (2023 KAP Survey)

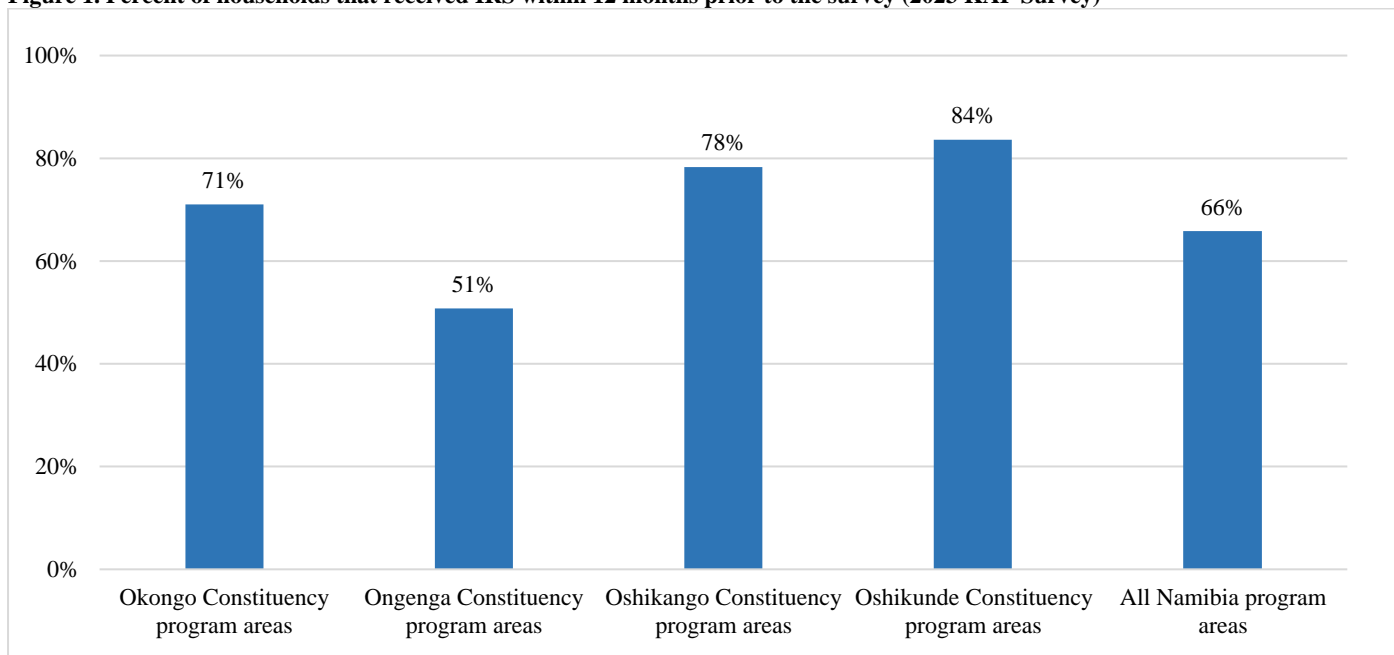
Education level	%
Never attended school	10%
Attended some primary school	24%
Completed primary school	20%
Attended some secondary school	34%
Completed secondary school	9%
Higher than secondary school	3%
Not sure	0

Indoor residual spraying (IRS)

Figure 1. shows the percent of households that reported receiving IRS within 12 months prior to the 2023 KAP Survey, among program areas within program areas that were targeted to receive IRS within 12 months prior to the 2023 KAP Survey.

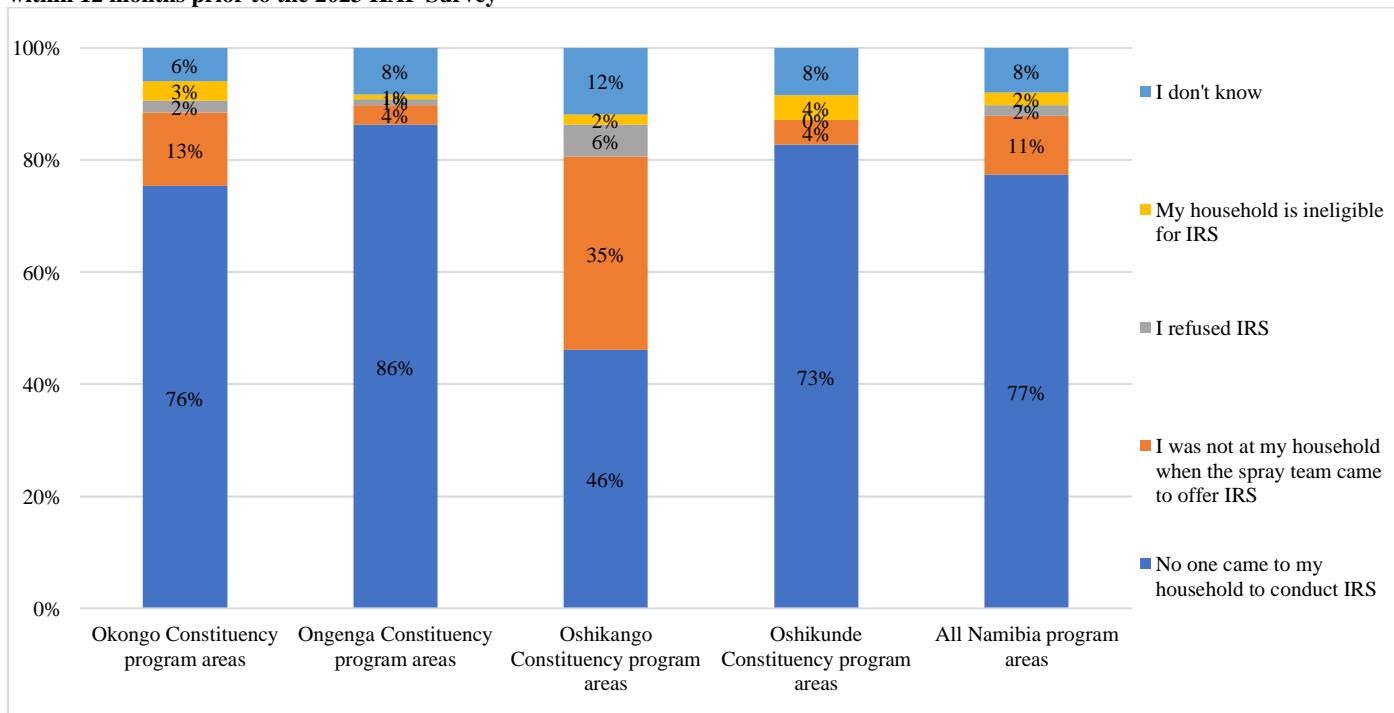
The World Health Organization indicates that at least 85% of households within a targeted area must receive IRS in order for IRS to be most effective. The 2023 KAP Survey results showed that past-12 month household IRS coverage did not reach the WHO-recommended level of $\geq 85\%$ within program areas targeted to receive IRS. However, program areas within Oshikunde Constituency came close to this benchmark; 84% of households in targeted areas reported receiving IRS within 12 months prior to the 2023 KAP Survey.

Figure 1. Percent of households that received IRS within 12 months prior to the survey (2023 KAP Survey)



If a respondent indicated that their household did not receive IRS within 12 months prior to the survey, they were asked why their household did not receive it, shown in Figure 2. Across all program areas, the most common reason given for not receiving IRS was “no one came to my household to offer IRS” (77%). In Oshikango Constituency program areas, there were also a large portion of households that said they did not receive IRS because they “were not at the household when the spray team came to offer IRS.”

Figure 2. Percent of households that reported various reasons for not receiving IRS, among households that reported not receiving IRS within 12 months prior to the 2023 KAP Survey

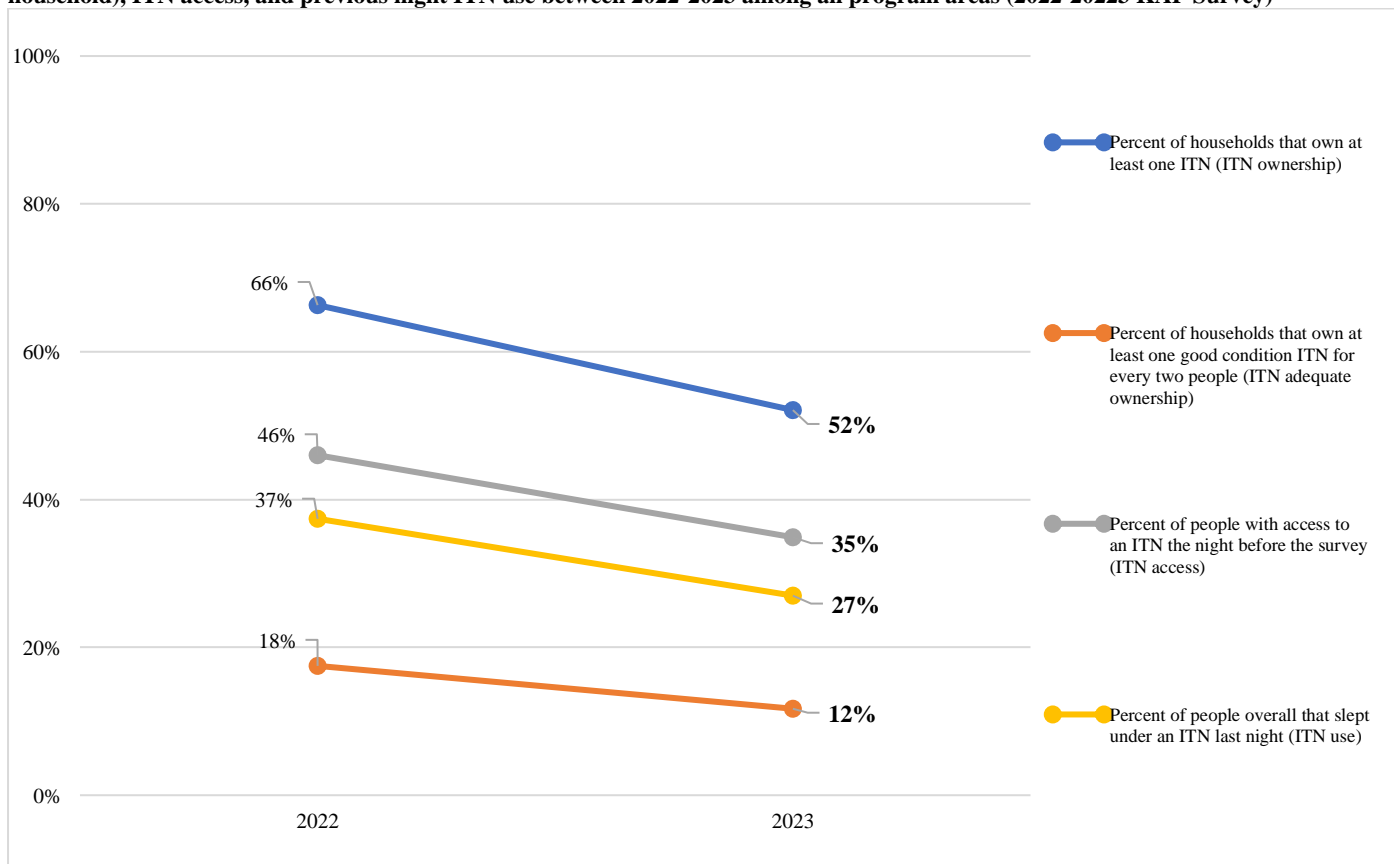


Insecticide treated nets (ITNs)

All participants were asked about their household ITN ownership, intrahousehold access to ITNs, and use of ITNs the night before the survey among household members.

Across all TKMI / Isdell:Flowers program areas, all key ITN indicators – household ownership of ITNs, access to ITNs (assuming each ITN covers two people), and use of ITNs the previous night – decreased significantly between 2022-2023 ($p < 0.001$). Figure 3. displays four ITN indicators, with the statistically significant changes between 2022-2023 denoted in bold.

Figure 3. Change in household ITN ownership (of at least one ITN and of at least one ITN in good condition to cover everyone in the household), ITN access, and previous night ITN use between 2022-2023 among all program areas (2022-2023 KAP Survey)



The following results dive deeper into the 2023 KAP Survey data to better understand the current reality of ITNs within TKMI / Isdell:Flowers program areas.

Figure 4. shows varying levels of household ITN ownership (2023 KAP Survey). Across all program areas, 52% of households owned at least one ITN and 44% of households owned at least one ITN in good condition. 18% of households owned at least one ITN for every two people in the household and only 12% of households owned at least one ITN in good condition for every two people in the household. This pattern is consistent when stratified by program areas at the Constituency level.

Figure 4. Percent of households owning ITNs in various quantities (2023 KAP Survey)

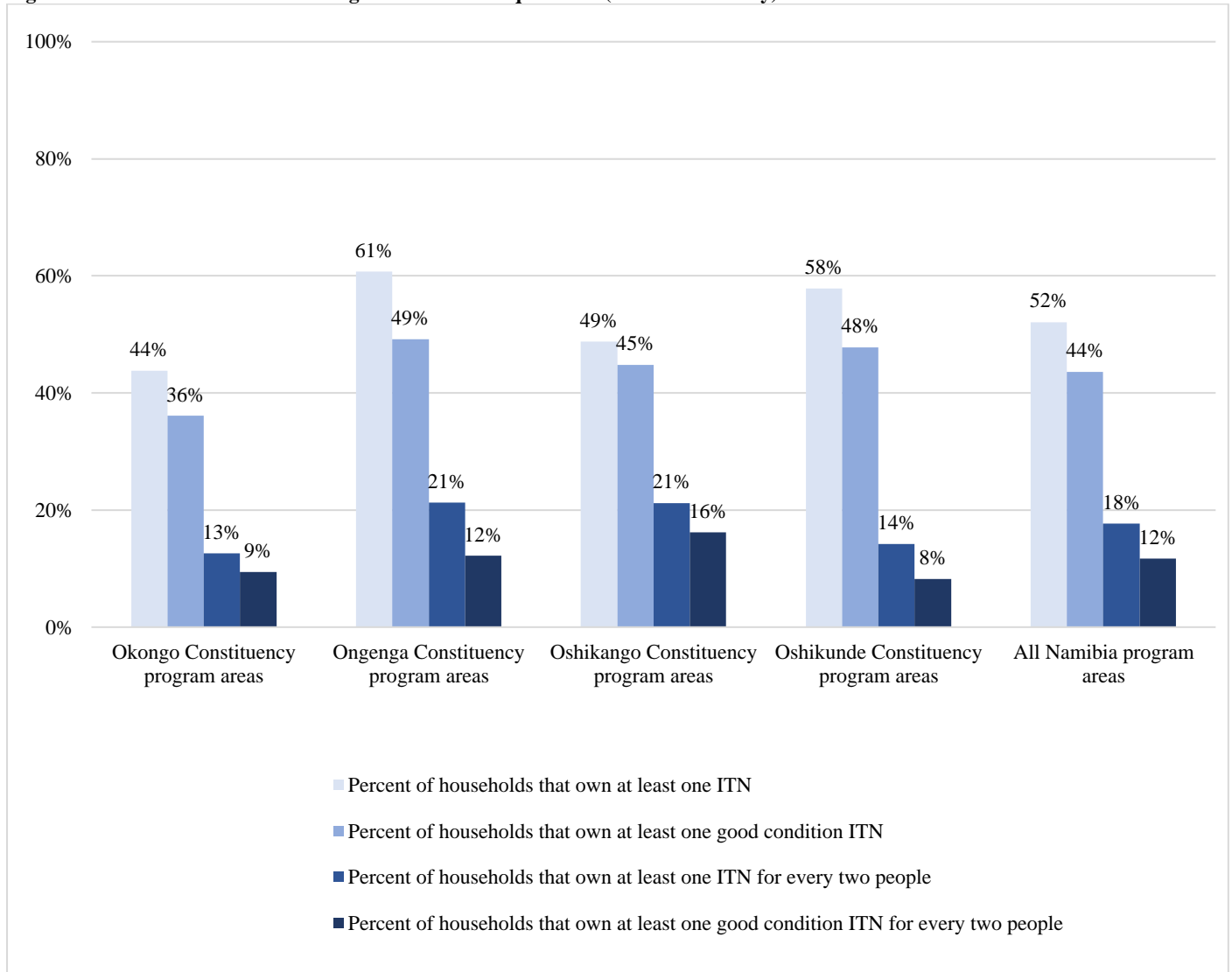


Figure 5. describes intrahousehold access to ITNs, which is the household average of the percent of people who had access to an ITN within their own household the night before the survey, assuming each ITN covers two people. In general, access to ITNs is low; across all program areas, 35% of people had access to an ITN the night before the survey.

Figure 5. Percent of people who had access to an ITN within their own household the previous night, assuming each ITN covers two people (2023 KAP Survey)

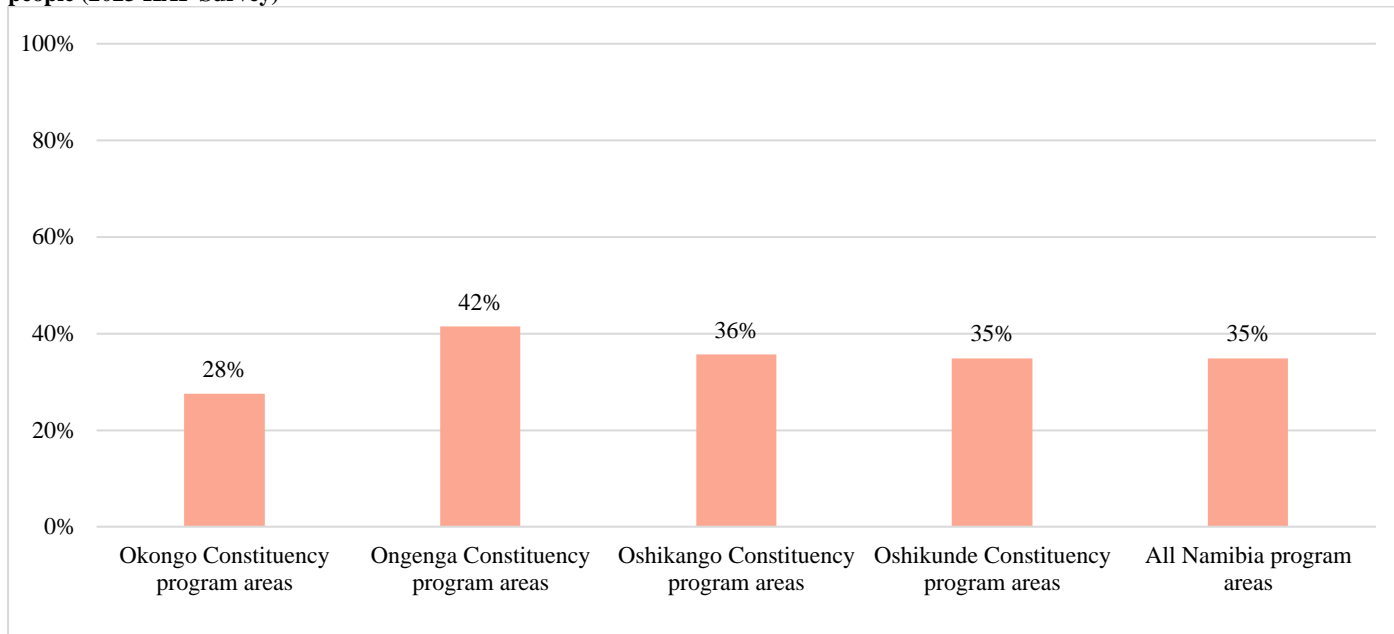
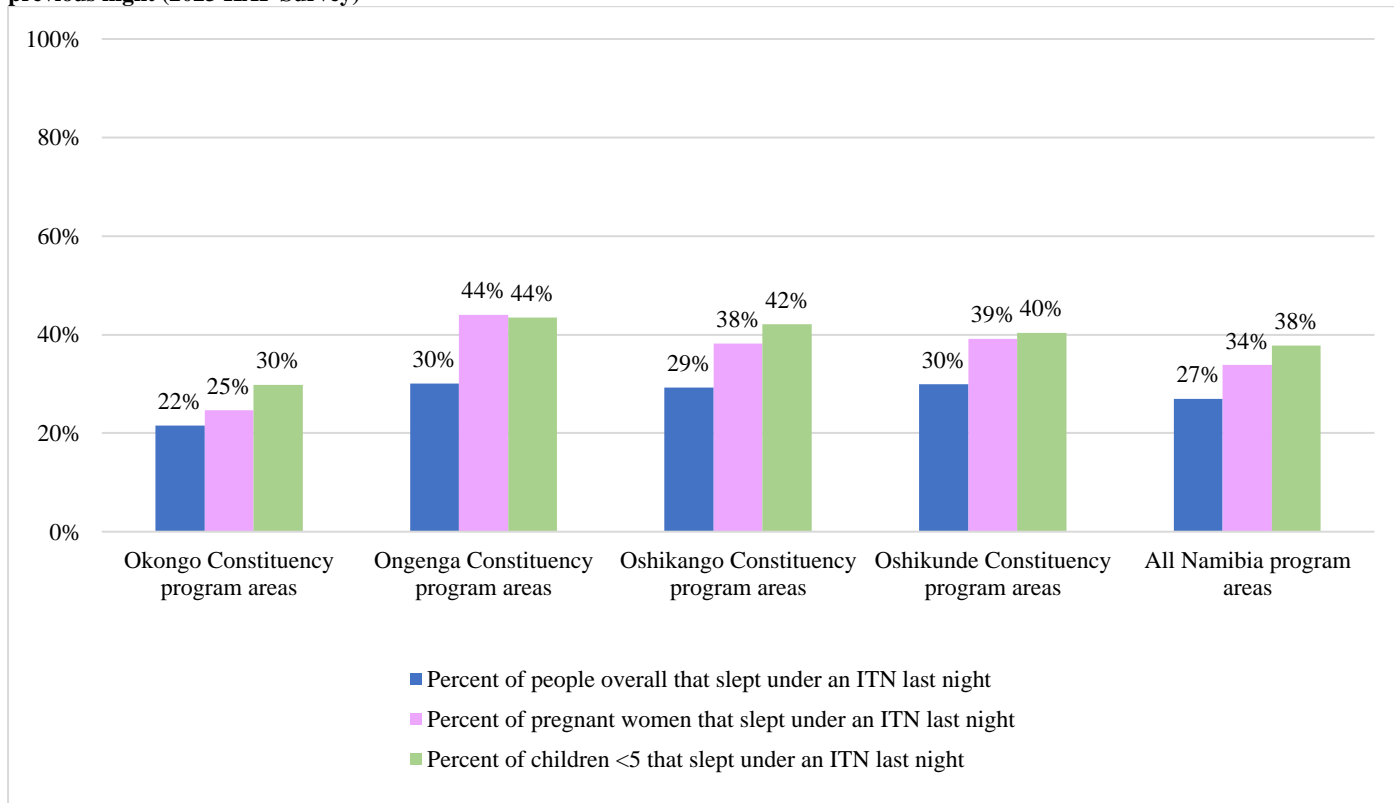


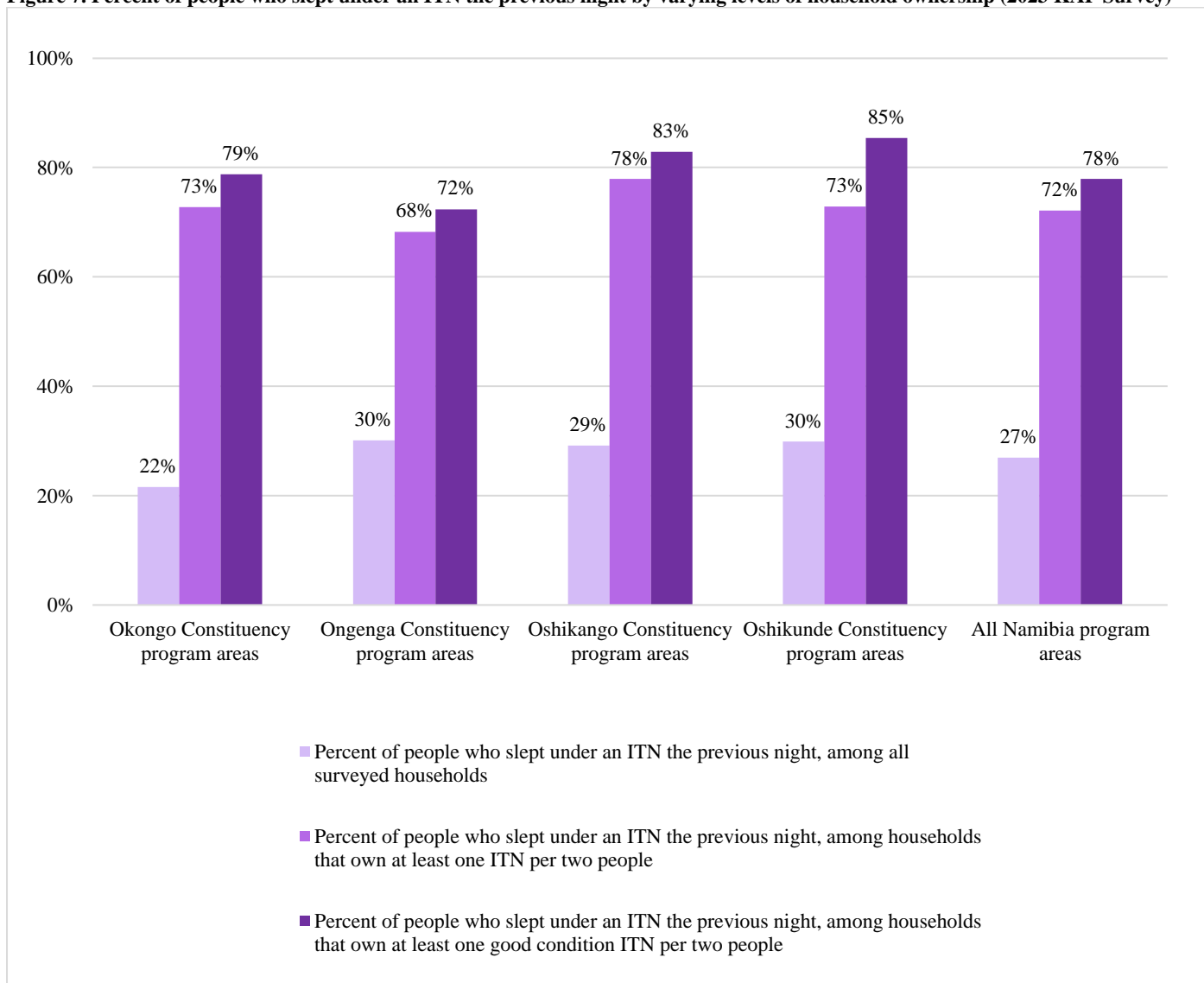
Figure 6. shows ITN use, this is the percent of people who slept under an ITN the previous night (2023 KAP Survey). The graph displays ITN use among all household members (the household average), among pregnant women, and among children <5. Across all program areas, 27% of people overall, 34% of pregnant women, and 38% of children <5 slept under an ITN the night before the survey. Though these higher risk groups are not fully covered by ITNs, pregnant women and children <5 slept under ITNs at higher levels than the general population, suggesting that these groups are correctly being prioritized to sleep under ITNs when there aren't enough ITNs to cover everyone in the household.

Figure 6. Percent of people (household average), percent of pregnant women, and percent of children <5 who slept under an ITN the previous night (2023 KAP Survey)



Most people who *did* have access to an ITN, however, slept under it the previous night, though there is still room for improvement. Figure 7. shows the percent of people who slept under an ITN the previous night among three different groups: 1) among all households, regardless of whether they own any ITNs; 2) only among households that own at least one ITN for every two people in the household; and 3) only among households that own at least one ITN *in good condition* for every two people in the household (2023 KAP Survey). While only 27% of people used an ITN the previous night across all surveyed households regardless of ITN ownership, 78% of people used an ITN among households that own at least one ITN in good condition for every two people in the household. This illustrates that the low overall ITN use (27%) is likely due to lack of access to ITNs, and that most people will use an ITN if they have one. However, there are still many people (22% across all program areas) who had access to a good condition ITN in their household but did not sleep under it the previous night, which also suggests a continued need for behavior change.

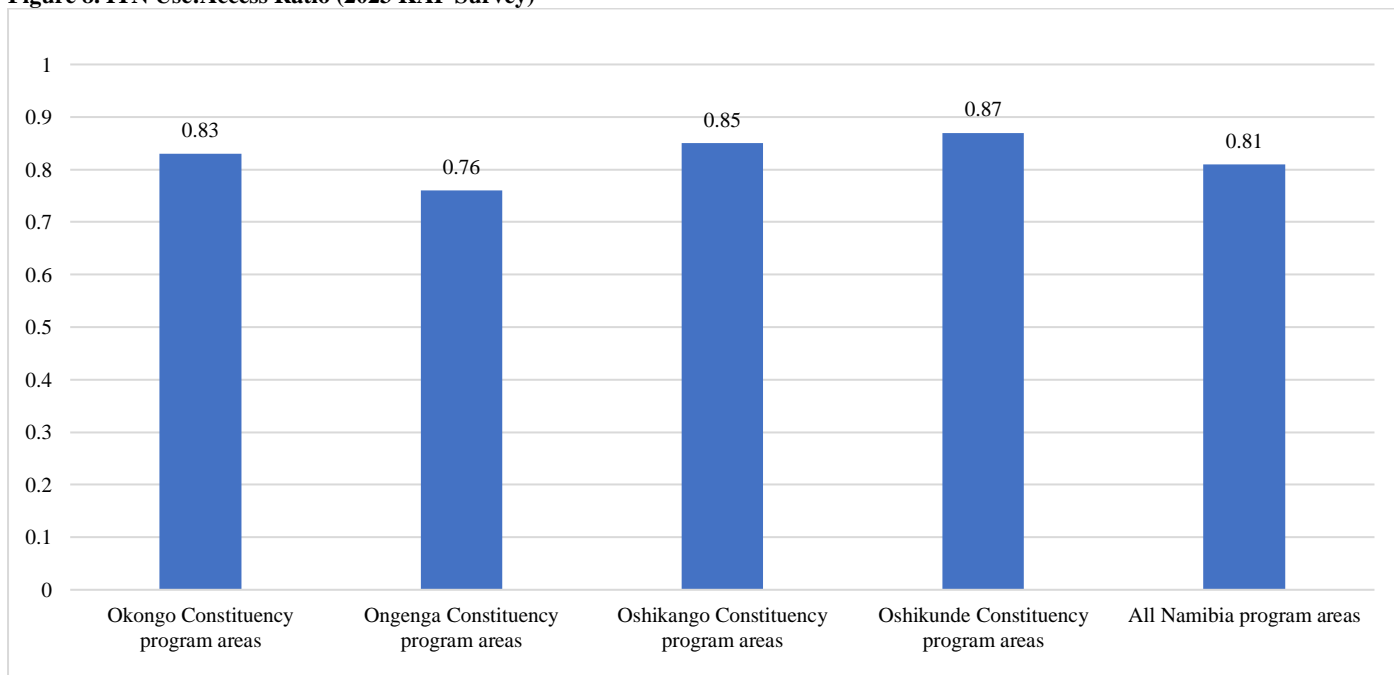
Figure 7. Percent of people who slept under an ITN the previous night by varying levels of household ownership (2023 KAP Survey)



The ITN Use:Access Ratio (Koenker and Kilian 2014) is a recommended indicator to better understand whether low ITN use (proportion of people who slept under an ITN the previous night) is due to a lack of the desired behavior of sleeping under an ITN that the household already owns, or due to lack of access to an ITN within the household. Ratios of ITN use to ITN access above 1.0 indicate that more than two people are sharing a net, on average. Ratios above 0.80 indicate that there is likely only a small amount of room for improvement in the behavior of sleeping under an ITN.

Figure 8 shows the ITN Use:Access Ratio from the 2023 KAP Survey. Across all Namibia program areas, the ITN Use:Access Ratio was 0.81, which suggests that desired ITN use behavior is relatively high but still has room for improvement, especially in Ongenga Constituency program areas where the ratio is lowest at 0.76.

Figure 8. ITN Use:Access Ratio (2023 KAP Survey)

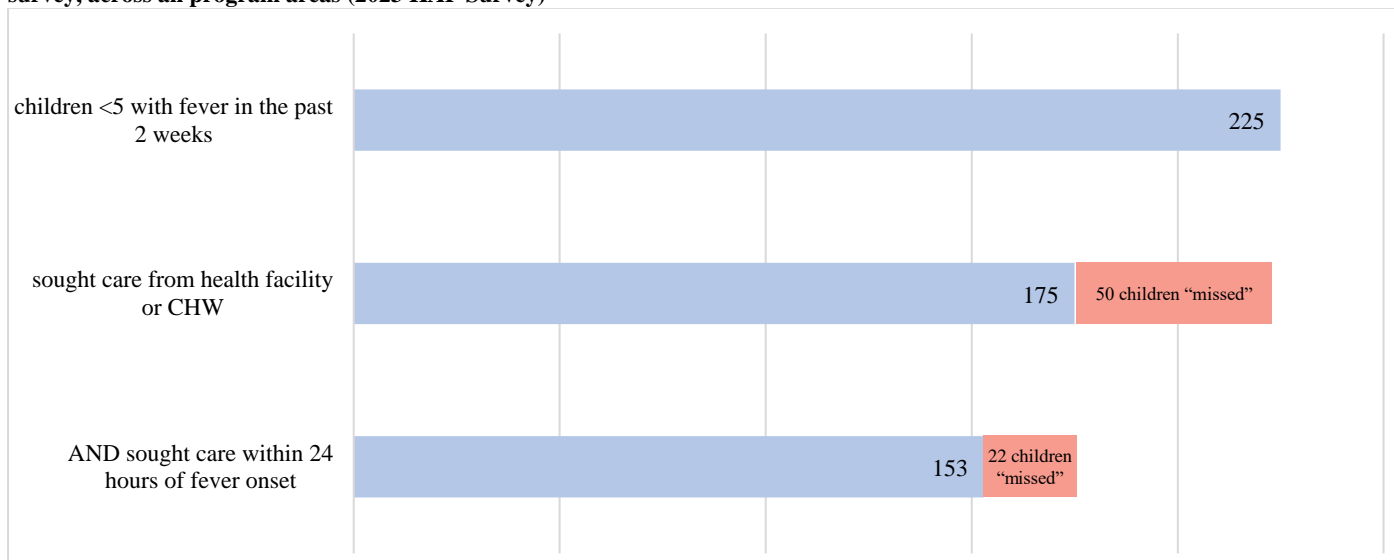


Care-seeking behaviour

There are several key steps in the ideal trajectory of care for children under five years (<5) with fever: go to a health facility or community health worker (CHW) and do so within 24 hours of fever onset, receive a malaria test, receive treatment if positive for malaria, and take the full course of the medication. Each step in the trajectory of care presents an opportunity for children to be “missed” and, therefore, for possible malaria infections to be left undiagnosed or untreated. The steps in the trajectory of care depend on both individual behavior and availability of health services. The trajectory of care cascade (Figure 8) helps to visualize the existing gaps within the care-seeking trajectory of children <5 with fever (2023 KAP Survey).

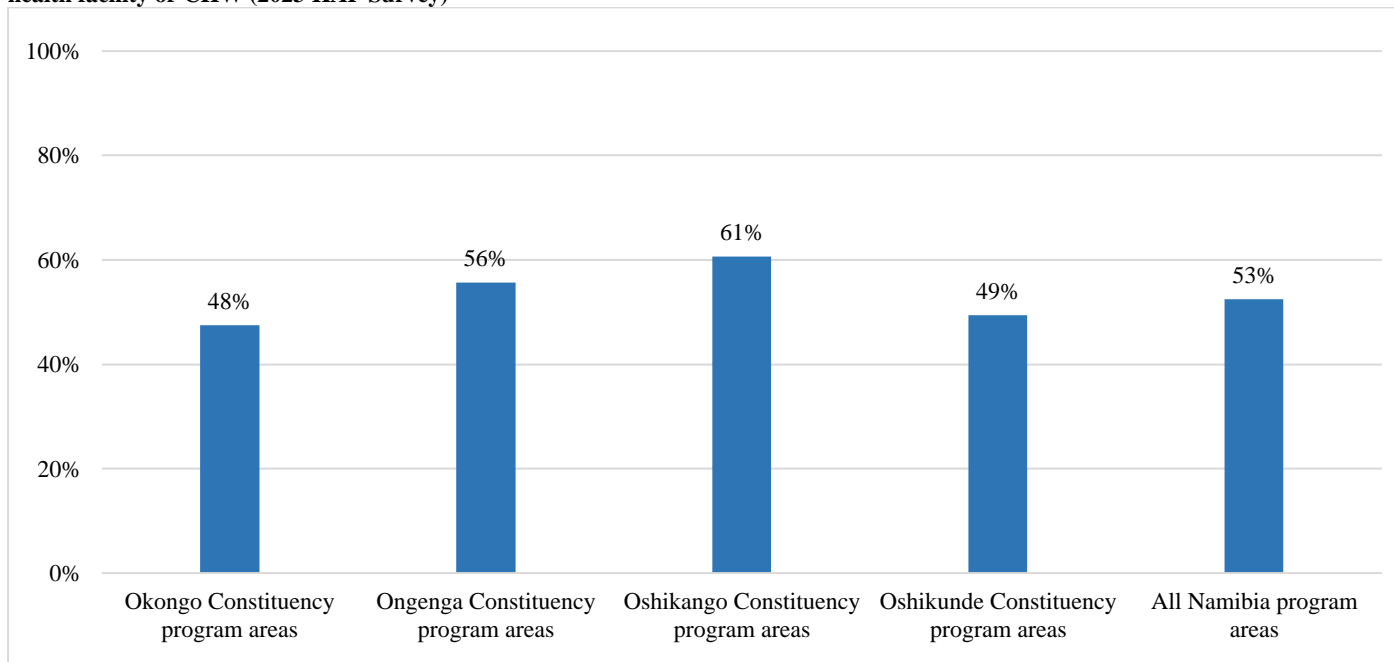
Figure 9 shows that the largest gaps in the care seeking trajectory are: 1) seeking care for the fever from a health facility or CHW; and 2) doing so within 24 hours of the onset of the fever. 78% (175/225) of children <5 with fever in the past two weeks sought care from a health facility or CHW and only 68% (153/225) did so within 24 hours of fever onset.

Figure 9. Number of children at each step in the trajectory of care cascade for children <5 with fever within the two weeks prior to the survey, across all program areas (2023 KAP Survey)



Another key step in the trajectory of care for children <5 with fever is receiving a malaria test to determine if the fever is being caused by malaria or by something else. Figure 10 shows the percentage of children <5 with fever in the past two weeks that received a malaria test, among those who sought care from a health facility or CHW. Across all program areas, 53% of children <5 with fever in the past two weeks received a malaria test, among those who sought care from a health facility or CHW. Out of the 91 children who received a malaria test, 7 reportedly tested positive for malaria (not shown in graphical format).

Figure 10. Percent of children <5 with fever in the past two weeks that received a malaria test, among those who sought care from a health facility or CHW (2023 KAP Survey)



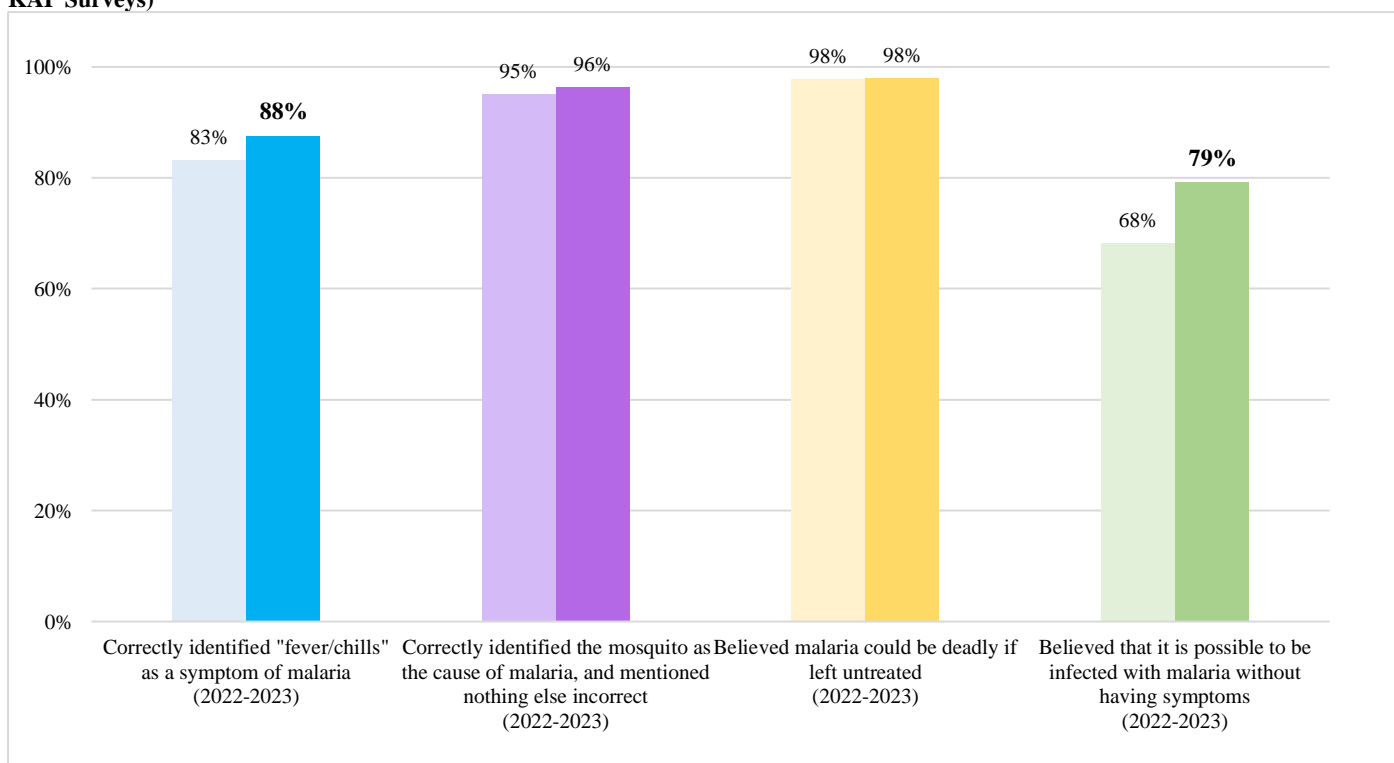
Knowledge and attitudes

Respondents were asked questions pertaining to their knowledge of malaria symptoms and cause. Figure 11. shows the percent of respondents that correctly answered four malaria-related knowledge questions in 2022 and 2023 survey years:

1. Participants were asked what they believed were the symptoms of malaria. The first set of bars on the left (blue) shows the percent of respondents that correctly identified “fever” (or “feeling cold/chills”) as a symptom of malaria.
2. Participants were asked what they believed was the cause of malaria. The second set of bars (purple) shows the percent of respondents that correctly identified the mosquito as the cause of malaria transmission and mentioned nothing else incorrect (such as getting soaked by rain or eating unripe fruit).
3. Participants were asked if they believed that malaria could be deadly if it is left untreated. The third set of bars (yellow) shows the percent of respondents that did believe that malaria could be deadly if left untreated.
4. Participants were asked if they believed that it is possible to be infected with malaria without having symptoms or feeling ill (subclinical/low-density malaria infection). The fourth set of bars on the right (green) shows the percent of respondents that did believe that it is possible to be infected with malaria without having symptoms.

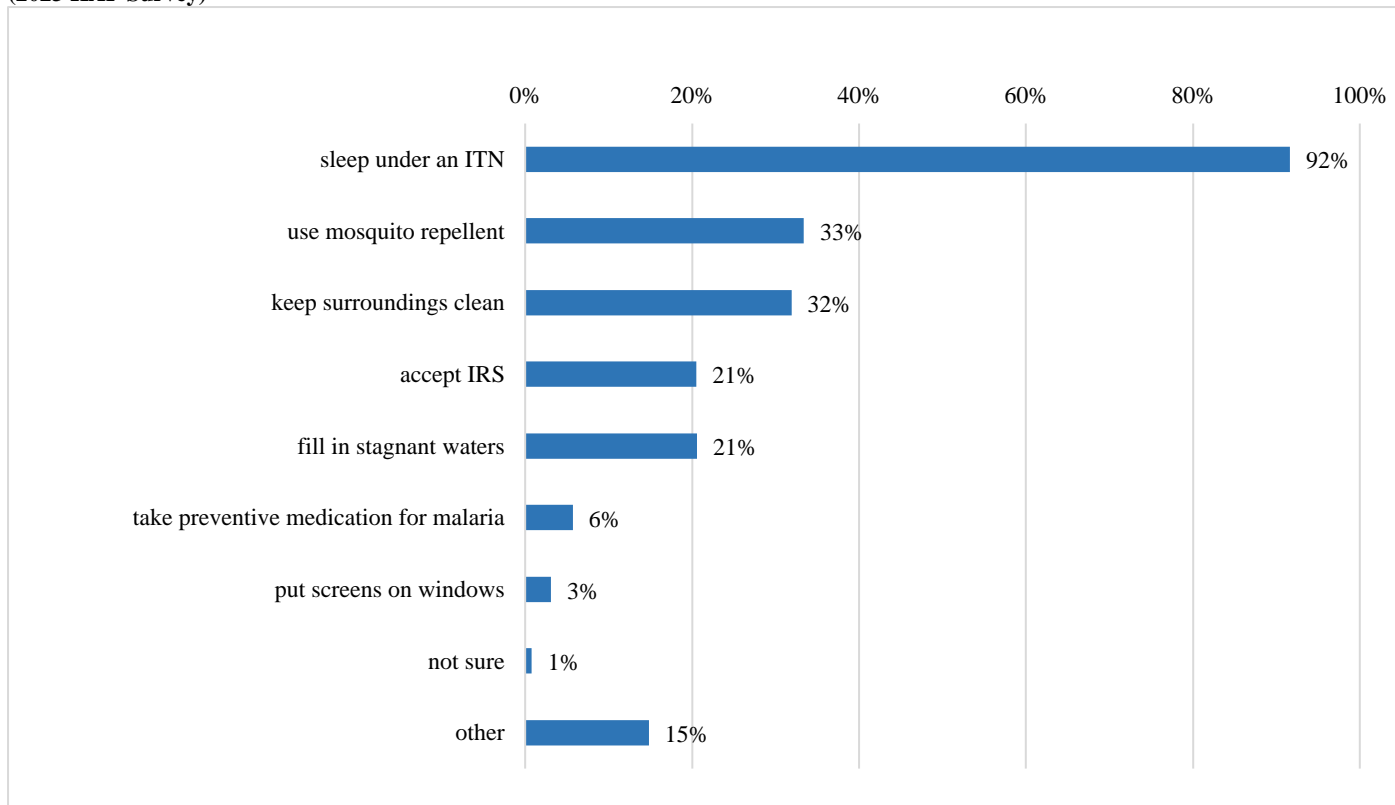
Between 2022 and 2023, levels of malaria-related knowledge increased across all program areas. The percent of respondents who correctly identified “fever/chills” as a symptom of malaria increased significantly from 83% in 2022 to 88% in 2023 ($p < 0.001$); however, there is still room for continued improvement in correctly identifying fever as a symptom of malaria. The percent of respondents who believed that it was possible to be infected with malaria without having symptoms also increased significantly from 68% in 2022 to 79% in 2023 ($p < 0.001$). There is still room for improvement in knowledge of asymptomatic/low-density malaria infections, especially as Namibia moves closer toward the goal of malaria elimination when low-density malaria infections make up an increasingly larger portion of overall malaria infections which can contribute to a persistent malaria reservoir if those cases are not detected and treated. Knowledge levels of mosquito as the cause of malaria and that malaria infections can be deadly if left untreated are very high (96% and 98%, respectively).

Figure 11. Percent of respondents that correctly answered malaria-related knowledge questions, among all program areas (2022-2023 KAP Surveys)



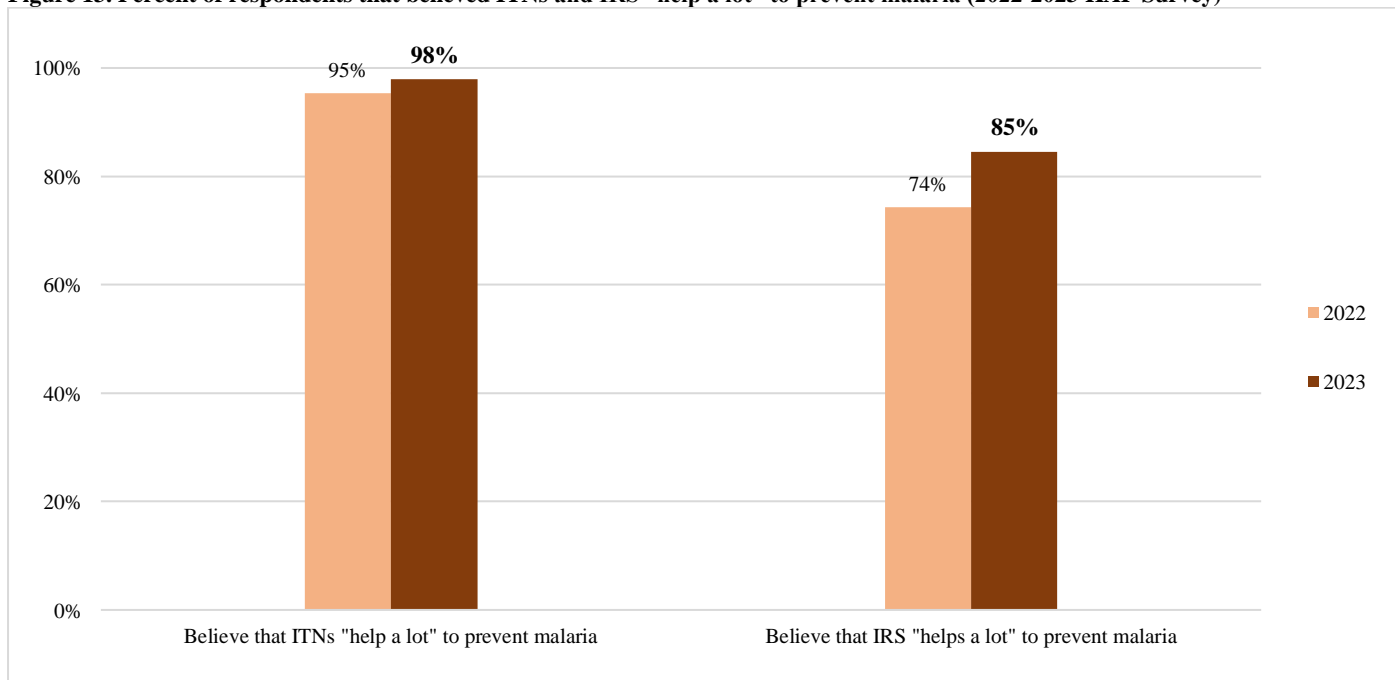
Participants were also asked if they believed there were actions that one could take to help prevent malaria infection; 97% (2378/2449) believed that there were. Those who believed there were actions that one could take to help prevent malaria were then asked to list off the actions or things that could do so, shown in Figure 12 (2023 KAP Survey). The most mentioned preventive action was “sleeping under an ITN” (97%). The second most mentioned preventive action was to “use mosquito repellent” (33%).

Figure 12. Percent of respondents that listed various protective measures when asked what one can do to protect oneself from malaria (2023 KAP Survey)



Finally, to understand attitudes toward key malaria elimination interventions, participants were asked if they believed that ITNs and IRS “help a lot,” “help a little,” or “does not help” to prevent malaria, shown in Figure 13 (2023 KAP Survey). Most participants believed that ITNs (98%) and IRS (85%) “help a lot” to prevent malaria. Both attitudes increased significantly between 2022-2023 ($p < 0.001$), with the most drastic increase seen in positive attitudes toward IRS. However, there is still room for continued improvement in the proportion of respondents who have positive attitudes toward IRS, especially in areas that are targeted to receive IRS.

Figure 13. Percent of respondents that believed ITNs and IRS “help a lot” to prevent malaria (2022-2023 KAP Survey)



Appendix 1. 2023 KAP Survey sampling frame (TKMI / Isdell:Flowers program areas)

Region	Constituency	Village	Targeted to receive IRS within 12 months prior to 2023 KAP Survey	Month IRS was conducted
Ohangwena	Ongenga	Onangama A	X	Nov-22
		Onangama B	X	Nov-22
		Eenghoshi A	X	Nov-22
		Eenghoshi C	X	Nov-22
		Oshindobe Hakandonge	X	Nov-22
		Eembwakuni	X	Nov-22
		Ohadiwa Kaula	X	
		Ohadiwa yaShanghala	X	
		Ohadiwa yaShindinge	X	
		Eenghoshi B	X	Nov-22
		Ohadiwa yaHaimbodi	X	
		Okalondo	X	
		Onangama C	X	Nov-22
		Okafitu	X	
		Onawa	X	
		Oimwandi	X	
		Ongenga	X	Dec-22
		Ohadiwa yaHamakali	X	
		Ondobeyomunghudi A	X	Nov-22
		Oshikwiyu	X	
		Oshali D, Haipopya	X	Nov-22
		Okalyafengwa	X	Oct-22
		Oshali shaShiweda	X	Oct-22
		Ondobeyomunghudi B	X	Oct-22
		Oshindobe B	X	Oct-22
		Oshindobe A	X	Oct-22
		Eengwena B	X	Oct-22
		Eengwena C	X	Oct-22
		Eengwena A	X	Oct-22
		Okambebe	X	Oct-22
		Oshali shaAmbrosius	X	
		Omufitu waNakashole	X	
		Ofaitumbo	X	
		Eengava	X	Dec-22
		Onghala A	X	Nov-22
		Okalondo kakakaya	X	
		Onghala B	X	Nov-22
		Elakalapwa	X	
		Oikoto	X	
		Eengwe	X	
		Oshali shaPeelo	X	Nov-22
		Omatangela A	X	
		Omatangela B	X	
		Omholo	X	
		Eenghudi	X	
	Onakaolo	X		
	Obenoni	X	Dec-22	
	Eembo	X	Dec-22	
	Oimbandalunga	X	Nov-22	
	Onanghwe	X	Oct-22	
	Okadiva 2	X	Nov-22	
	Okadiva 1	X	Nov-22	
	Oyongo	X	Nov-22	
	Odibo	X	Oct-22	
	Oshikango	X	Oct-22	
	Onamhinda	X	Oct-22	
	Okatale	X	Oct-22	
	Oshalande	X	Oct/Dec 2022	
	Oshalunghima		Oct/Dec 2022	
	Ekoka	X	Oct/Dec 2022	
Ohenghombo	X	Oct/Dec 2022		
Oshalumbu	X	Oct/Dec 2022		
Onhuli	X	Oct/Dec 2022		
Ehafo	X	Oct/Dec 2022		
Olukula	X	Oct/Dec 2022		
Ongalangobe				
Okongo	X	Oct/Dec 2022		
Ohameva	X	Oct/Dec 2022		

Region	Constituency	Village	Targeted to receive IRS within 12 months prior to 2023 KAP Survey	Month IRS was conducted
		Omuwike	X	Oct/Dec 2022
		Okalunga/Onamata	x	
		Oluhapa	X	Oct/Dec 2022
		Omulamba A	X	Oct/Dec 2022
		Ombuudiya	X	Oct/Dec 2022
		Oshuudiya (Shapopi)	X	Oct/Dec 2022
		Onheleiwa	X	Oct/Dec 2022
		Omauni # 1 & 2	X	Oct/Dec 2022
		Onhehanga	X	Oct/Dec 2022
		Omushiyo		
		Enyana		
		Omboloka	X	Oct/Dec 2022
		Oshamukweni	X	Oct/Dec 2022
		Oshamambo	X	Oct/Dec 2022
		Kumininenge	X	Oct/Dec 2022
		Onghwiyu #1	x	Oct/Dec 2022
		Odevadema	x	Oct/Dec 2022
		Oshushu	X	
		Oidiva	x	Oct/Dec 2022
		Onhumba	X	
		Oshinanyiki	x	Oct/Dec 2022
		Oshishogolo	X	Oct/Dec 2022
		Oshitishiwa	X	
		Olutwatwa	x	Oct/Dec 2022
	Omupembe	X		
	Ekangolomuve	x	Oct/Dec 2022	
	Oshikoxa	x	Oct/Dec 2022	
	Omanha #1	x	Oct/Dec 2022	
	Omanha #2	x	Oct/Dec 2022	
	Onamafila			
	Oshifitu	X	Oct/Dec 2022	
	Oshambada	X	Oct/Dec 2022	
	Emanya	X	Oct/Dec 2022	
	Ondobe Yelao	X	Oct/Dec 2022	
Oshitayi	X	Oct/Dec 2022		
Oshilambwili	X	Oct/Dec 2022		
Ombuumbu	X	Oct/Dec 2022		
Embwanyana				
Oluwaya	X	Oct/Dec 2022		
Oupili	x	Oct/Dec 2022		
	Oshikunde			

Appendix 2. References

Koenker, Hannah, and Albert Kilian. 2014. "Recalculating the Net Use Gap: A Multi-Country Comparison of ITN Use versus ITN Access." *PLoS One* 9(5): e97496.