

J.C. FLOWERS
FOUNDATION



Namibia Anglican Community Development Organization (NACDO)

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

**Results from Namibia Program Areas
Data collected between 12 April and 24 May 2022**

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Abbreviations

CHW	community health worker
CMV	community malaria volunteer
IFCBMI	Isdell:Flowers Cross Border Malaria Initiative
IRS	indoor residual spraying
ITN	insecticide treated net
KAP	knowledge, attitudes, and practices
MoHSS	Ministry of Health and Social Services
NACDO	Namibia Anglican Community Development Organization
NVDCP	National Vector-borne Disease Control Program
TKMI	Trans Kunene Malaria Initiative

Section 1. Executive Summary

Through the Isdell:Flowers Cross Border Malaria Initiative (IFCBMI), the Namibia Anglican Community Development Organization (NACDO) of the Anglican Diocese of Namibia facilitates community engagement for malaria elimination in select communities in select border communities in Omusati and Oshana Regions, as part of the Trans-Kunene Malaria Initiative (TKMI) and in partnership with the National Vector-borne Disease Control Programme (NVDCP) of the Namibian Ministry of Health and Social Services (MoHSS), and the J.C. Flowers Foundation. IFCBMI conducted this study to understand malaria-related knowledge, attitudes, and practices (“KAP”) among community members living within program areas through a yearly a cross-sectional survey. The overall goal is to inform programmatic decisions based on local and recently collected data. The study’s main areas of inquiry are: reported use of and access to insecticide treated nets (ITNs); reported indoor residual spraying (IRS) coverage within 12 months prior to the survey; patterns of care-seeking behaviour among children under five years (<5) with fever in the previous two weeks; knowledge of the cause of malaria, its symptoms, and its mitigation; and attitudes towards ITNs and IRS. This report presents key findings from the 2022 KAP Survey and select results from the 2020 and 2021 KAP Surveys for comparison. Results are representative of IFCBMI program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels. A full listing of IFCBMI Namibia program areas can be found in Appendix 1. Key results from the 2022 KAP Survey are below:

Indoor residual spraying (IRS)

Within program areas that received IRS within 12 months prior to the survey, 64% of surveyed households reported receiving IRS.

Household IRS coverage did not reach WHO-recommended levels ($\geq 85\%$) within program areas that received IRS within the 12 months prior to the survey. Among households that reportedly did not receive IRS, but were located in areas that were sprayed within 12 months prior to the survey ($n=76$), the most common reason given for not receiving IRS was “no one came to my household to conduct IRS” (67%, 52/76), followed by “I was not at my household when the spray team came to offer IRS” (12%, 9/76). Five of these households refused IRS.

Insecticide treated nets (ITNs)

Though there is some room for improvement, households generally used the ITNs that they already own. However, there were not enough ITNs in good condition to cover everyone in households located within program areas.

Across all program areas, 72% of households own at least one ITN, but only 64% own at least one ITN in good condition. Even fewer households (30%) own at least one ITN for every two people who slept in the household the previous night, and only 22% of households own at least one ITN in good condition for every two people who slept in the household the previous night.

Among all surveyed households, only 44% of people slept under an ITN the previous night. However, among households that own at least one ITN for every two people, 78% of people slept under an ITN the previous night, and 82% did so among households that own at least one good condition ITN for every two people. This suggests that most people will use an ITNs if they have access to one, meaning access to ITNs is a main driver of their use. However, there is still about one-fifth of people who had access to an ITN but did not use it the previous night, suggesting that there is still room for improving the behavior of sleeping under an ITN.

Across all Namibia program areas in 2022, ITN use by children <5 the previous night decreased significantly from 64% in 2021 to 59% in 2022 ($p=0.004$). However, ITN use by children <5 (64%), and ITN use by pregnant women (55%), is higher than ITN use by the general population (44%), indicating that in general, children <5 and pregnant women are being prioritized for ITN use when there are not enough ITNs to cover everyone in the household.

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

Only 56% of respondents whose child <5 had fever in the previous two weeks sought care from a health facility or CHW within 24 hours of the start of the fever.

Across all Namibia program areas, the largest gap in the care-seeking trajectory for children <5 with fever is seeking care within 24 hours of the start of the fever. In 2022, only 56% (113/203) of children <5 with fever in the previous two weeks sought care from a health facility or CHW within 24 hours of the start of the fever. Among children who sought care from a health facility or CHW in 2022, 45% (82/179) received a blood test for malaria. Among children who were tested for malaria, 13% (10/82) tested positive for malaria. Seven out of the ten children who tested positive for malaria received Coartem for malaria treatment.

Knowledge and attitudes

Malaria knowledge was high in general, though there is room to improve the proportion of people who know that fever is a main symptom of malaria. Most respondents believed that ITNs help to prevent malaria; fewer, but still the majority, believed that IRS helps to prevent malaria. Respondents who reportedly believed that IRS is not very effective may be well justified in their beliefs, since most program areas have not reached the WHO threshold for effective IRS coverage; IRS campaigns that achieve < 85% coverage may not be effective at preventing malaria transmission at a community level.

Across all Namibia program areas, 83% of respondents identified “fever” or “feeling cold/chills” as a symptom of malaria, and 96% of respondents identified the mosquito as the cause of malaria transmission and listed nothing else incorrect (a significant increase from 94% in 2021, $p=0.002$). While 95% of people believed that ITNs “help a lot” to prevent malaria, only 72% believed that IRS “helps a lot” to prevent malaria.

Section 2. Background

Through the Isdell:Flowers Cross Border Malaria Initiative (IFCBMI), the Namibia Anglican Community Development Organization (NACDO) of the Anglican Diocese of Namibia facilitates community engagement for malaria elimination in select communities in select border communities in Omusati and Ohangwena Regions, as part of the Trans-Kunene Malaria Initiative (TKMI) and in partnership with the National Vector-borne Disease Control Programme (NVDCP) of the Namibian Ministry of Health and Social Services (MoHSS), and the J.C. Flowers Foundation. IFCBMI 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.

NACDO supports a network of approximately 330 Community Malaria Volunteers (CMVs) and 12 community health workers (CHWs) who deliver malaria education and prevention services within their communities. Each CMV supports between 20-50 households, depending on their location. 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 MoHSS Research Ethics Committee to conduct a study to gain a better understanding of malaria-related knowledge, attitudes, and practices (“KAP”) among community members living within IFCBMI Namibia program areas. This study has three main areas of inquiry:

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

The KAP study collects data through a cross-sectional survey that is conducted yearly from 2020-2024, in order to understand change in the main areas of inquiry over time. 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 IFCBMI program areas in Angola, Zambia, and Zimbabwe. Study findings will also 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 2022 KAP Survey, with select results from the 2020 and 2021 KAP Survey for comparison over time. Results are representative of IFCBMI program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels. A full listing of the IFCBMI Namibia program areas included in the sampling frame can be found in Appendix 1.

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

Section 3. Methodology

Sampling frame and sample size

The sampling frame for the 2022 KAP Survey was all IFCBMI program areas in Namibia (Appendix 1). The 2022 sample size was determined to be a minimum of 1800 households, based on power calculations intending to achieve at least 80% power to detect annual incremental improvements in the primary outcome measures: the proportion of people who slept under an ITN the previous night, the proportion of households that received IRS within the prior 12 months, 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 the 2020 and 2021 KAP Surveys were calculated in the same manner. Table 1 shows sample sizes from 2020-2022 KAP Surveys and Table 2 shows dates of data collection. Results are representative of IFCBMI program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels.

Table 1. Namibia KAP Survey sample sizes (2020-2022)

Region	Constituency	Sample sizes		
		2020	2021	2022
Ohangwena	Ongenga	661	700	488
	Oshikango	357	382	285
Omusati	Etayi	642	625	460
	Outapi	729	794	624
TOTAL		2389	2501	1857
Response rate		99.9%	100%	100%

NACDO expanded to several communities within Okongo and Oshikunde Constituencies (within Ohangwena Region), after the 2021 KAP Survey was conducted. Since these new program areas were not surveyed in 2021, results from the 2022 KAP Survey do not include these new areas in order to maintain a comparable sampling frame between 2021-2022 KAP Survey years. For new program areas, separate sample sizes were calculated and a baseline KAP Survey was conducted in 2022. The sampling frame, methodology, and results from the KAP Survey in these new program areas can be found in Appendix 2.

Table 2. Dates of KAP Survey data collection (2020-2022)

Year	Dates of data collection
2020	3 June – 14 July
2021	18 May – 25 June
2022	12 April – 24 May

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.

Household selection

Households were sampled by systematic random sampling. A “skip pattern” was calculated such that for a sampling frame of H households comprising IFCBMI Zambia 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.

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 2020 and 2021 survey years and between 2021 and 2022 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

Table 3. Background characteristics, all Namibia program areas (2022)

Background characteristic	
Average age of respondent (n)	43
Percent of households with at least one child under 5 who slept there the previous night (%)	73
Average number of children <5 in household the previous night, among households with at least one child <5 (n)	1.9
Percent of 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)	6.8
Average number of sleeping spaces (n)	5.9
Percent of households with surrounding standing water, per visual observation of data collector (%)	30

Table 4. Respondent education level, all Namibia program areas (2022)

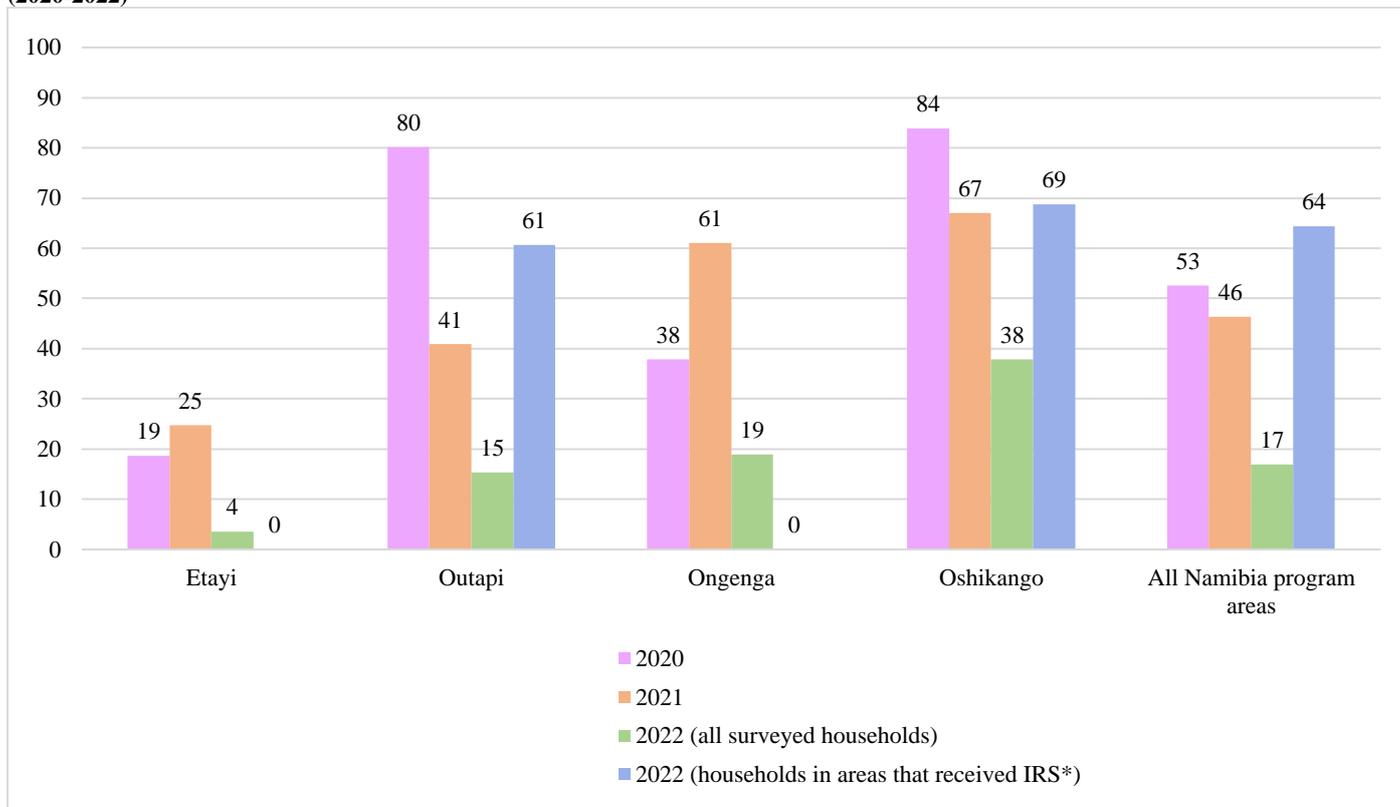
Education level	percent	number
Never attended school	12	222
Attended some primary school	32	602
Completed primary school	18	342
Attended some secondary school	28	506
Completed secondary school	8	139
Higher than secondary school	2	39
Not sure	0	3

Indoor residual spraying (IRS)

Figure 1 shows the proportions of households that reported receiving IRS within 12 months prior to the survey among all surveyed households from 2020-2022 survey years. Of note: not all program areas received IRS within 12 months prior to the survey, and thus the household IRS coverage indicator includes both areas that were received IRS and those that were not (a list of program areas that received IRS within the 12 months prior to the 2022 KAP Survey can be found in Appendix 1). To address this issue, a separate calculation for household IRS coverage was conducted for the 2022 survey year results, among only households that were located in villages that received IRS within 12 months prior to the survey. However, this calculation is not available for 2020 and 2021 survey year results.

Among all surveyed households, the percent of households that received IRS within 12 months prior to the survey decreased significantly from 46% (2021 survey) to 17% (2022 survey), $p < 0.001$. However, when looking only households that were located in villages that received IRS within 12 months prior to the survey, 64% of households were sprayed. Among program areas at the Constituency level, household coverage of IRS, among households located in villages that received IRS within 12 months prior to the survey, ranged from 61% in Outapi program areas to 69% in Oshikango program areas. Program areas in Etayi and Ongenga reportedly did not receive IRS within 12 months prior to the survey, and thus data is not reported. Household IRS coverage did not reach WHO-recommended levels ($\geq 85\%$) anywhere.

Figure 1. Percent of households that received IRS within 12 months prior to the survey, by program areas at the Constituency level* (2020-2022)



*Program area villages that reportedly received IRS within the 12 months prior to the survey can be found in Appendix 1.

Table 5. shows the percent of people who slept the previous night in a room that was sprayed with IRS within the previous 12 months (population IRS coverage, the night prior to the survey), among households located in areas that received IRS within 12 months prior to the survey. Etayi and Ongenga program areas are not included because no program areas reportedly received IRS within 12 months prior to the survey.

Table 5. Population coverage of indoor residual spraying (IRS) within 12 months prior to the survey, by program areas at the Constituency level* (2022)

Region	Constituency	People who slept the previous night in a room that was sprayed with IRS within the previous 12 months, among households in areas that received IRS
		%
Omusati	Outapi	52
Ohangwena	Oshikango	60

*Program areas that reportedly received IRS within the 12 months prior to the survey can be found in Appendix 1.

Respondents who reported that their household did not receive IRS within the previous 12 months were asked why they did not receive it. Table 6 displays reasons why households did not receive IRS among households located in areas that received IRS within the 12 months prior to the survey. Among these households, the most common reason given for not receiving IRS was “no one came to my household to conduct IRS” (67%, 52/76), followed by “I was not at my household when the spray team came to offer IRS” (12%, 9/76). Five out of 76 (7%) households reportedly refused IRS. Etayi and Ongenga program areas are not included because no program areas within these constituencies reportedly received IRS within 12 months prior to the survey.

Table 6. Reasons why households did not receive IRS in the previous 12 months (number of households), among households that were reportedly not sprayed but were located in areas that received IRS within the 12 months prior to the survey, by program areas at the Constituency level (2022)

		No one came to my household to offer IRS	No one was at my household when the spray team came to offer IRS	I refused IRS	My household was ineligible for IRS	I don't know
Region	Constituency	number of households				
Omusati	Outapi	32	1	3	3	7
Ohangwena	Oshikango	20	8	2	0	0

*Program areas that received IRS within the 12 months prior to the survey can be found in Appendix 1.

Insecticide treated nets (ITNs)

Participants were asked about their household ITN ownership and household use of ITNs the previous night. All respondents were asked questions about ITNs regardless of whether their household was located in an area that was targeted for ITN distribution in recent years.

Figure 2. shows the proportion of households that own at least one ITN, the proportion of households that own at least one ITN for every two people who slept in the household the previous night, the proportion of people who used an ITN the previous night, and the proportion of people with access to an ITN within their own household (assuming each ITN covers two people) from 2020-2022. Across all Namibia program areas, the proportion of households that own at least one ITN decreased significantly from 81% in 2021 to 72% in 2022 ($p < 0.001$). The proportion of households that own at least one ITN for every two people who slept in the household the previous night also decreased significantly from 41% in 2021 to 30% in 2022 ($p < 0.001$). Mirroring this trend of decreased ITN ownership, access to ITNs and use of ITNs also decreased; the proportion of people who had access to an ITN within their own household (assuming each ITN covers two people) decreased significantly from 64% in 2021 to 53% in 2022 ($p < 0.001$) and the proportion of people who used an ITN the previous night also decreased significantly from 50% in 2021 to 44% in 2022, ($p < 0.001$).

Figure 2. ITN access, use, and ownership (%), all Namibia program areas (2020-2022)

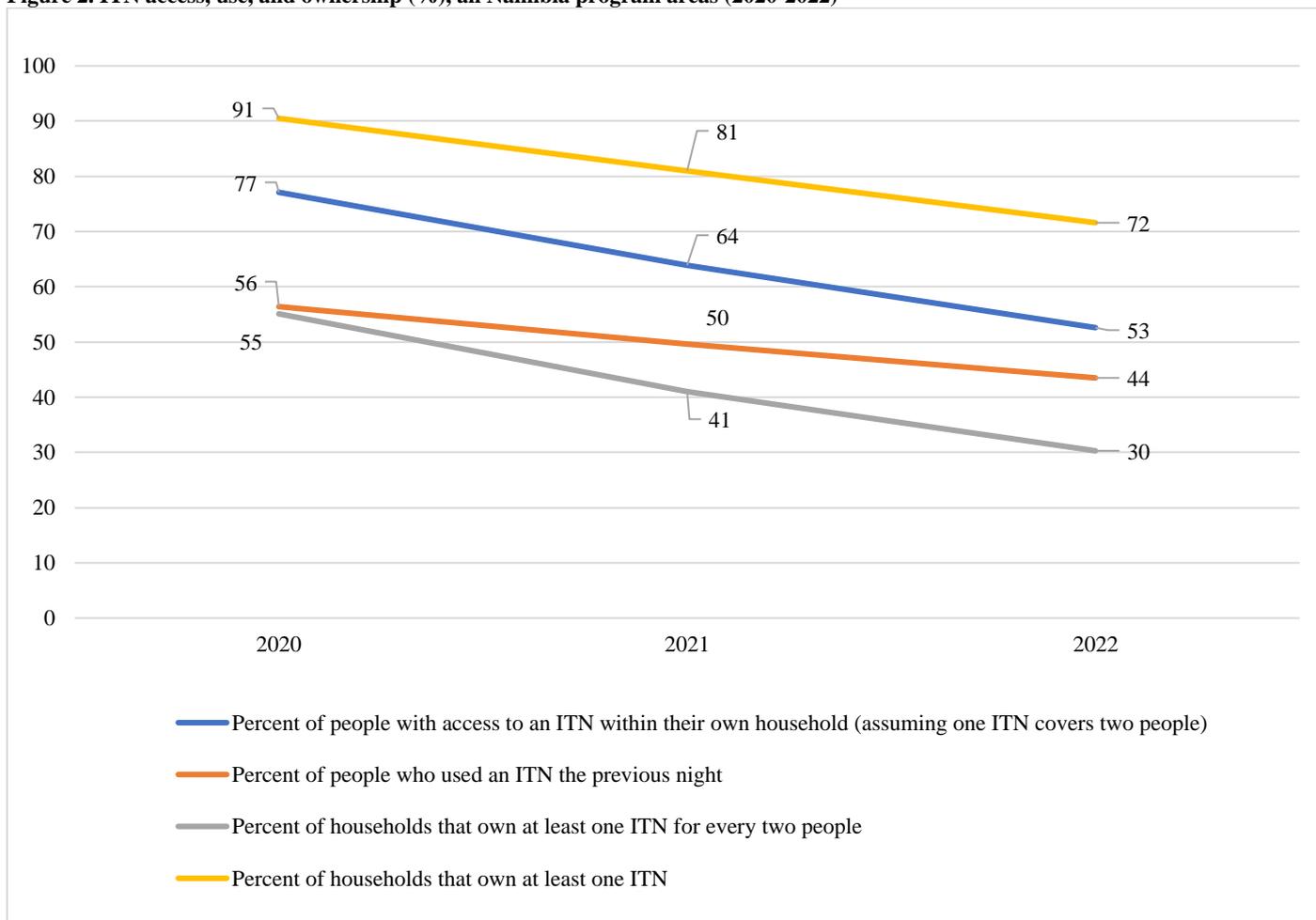


Figure 3. shows varying levels of ITN ownership. While 72% of households own at least one ITN, only 64% own at least one ITN in good condition, defined as not having any holes larger than a thumb (condition of ITNs was reported only, not confirmed visually). Even fewer households (30%) owned at least one ITN for every two people who slept in the household the previous night, and only 22% of households owned at least one ITN in good condition for every two people who slept in the household the previous night. This overall trend was mirrored among program areas at the Constituency level, and ITN ownership remains relatively homogeneous across constituencies.

Figure 3. Household ownership of ITNs (%), by program areas at the Constituency level (2022)

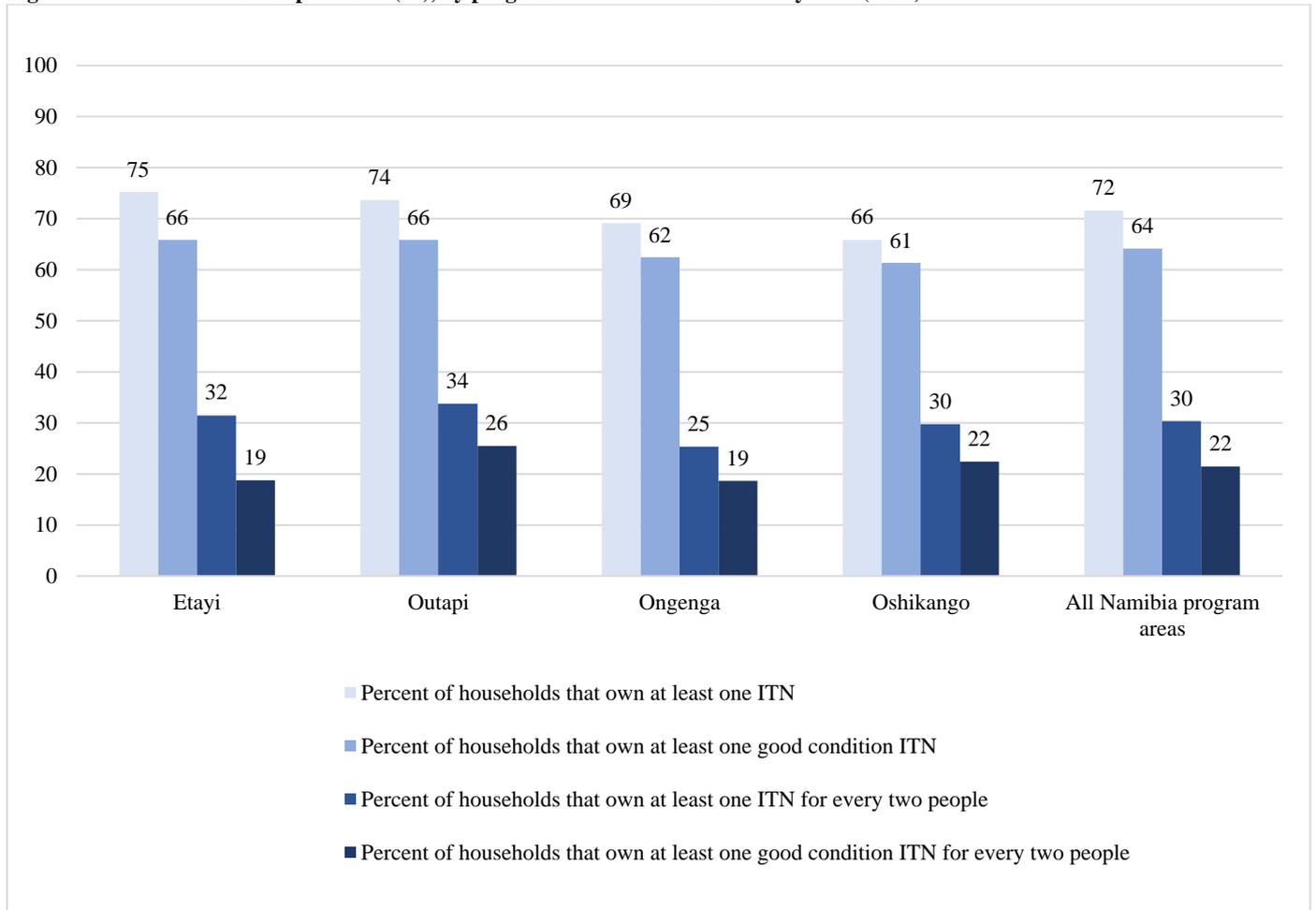


Figure 4. shows the proportion of pregnant women who slept under an ITN the previous night from 2020-2022. Across all Namibia program areas in 2022, ITN use by pregnant women (55%) is higher than ITN use by the general population (44%, shown in Figure 1), indicating that, in general, pregnant women are being prioritized to sleep under ITNs when there are not enough ITNs in the household to cover everyone who slept there. This trend was mirrored among program areas at the Constituency level. ITN use by pregnant women in 2022 ranges from 49% in Ongenga program areas to 61% in Outapi program areas. Changes between 2021-2022 were non-significant at all levels, likely due to the smaller subsample of households with a pregnant woman.

Figure 4. Percent of pregnant women who slept under an ITN the previous night, by program areas at the Constituency level (2020-2022)

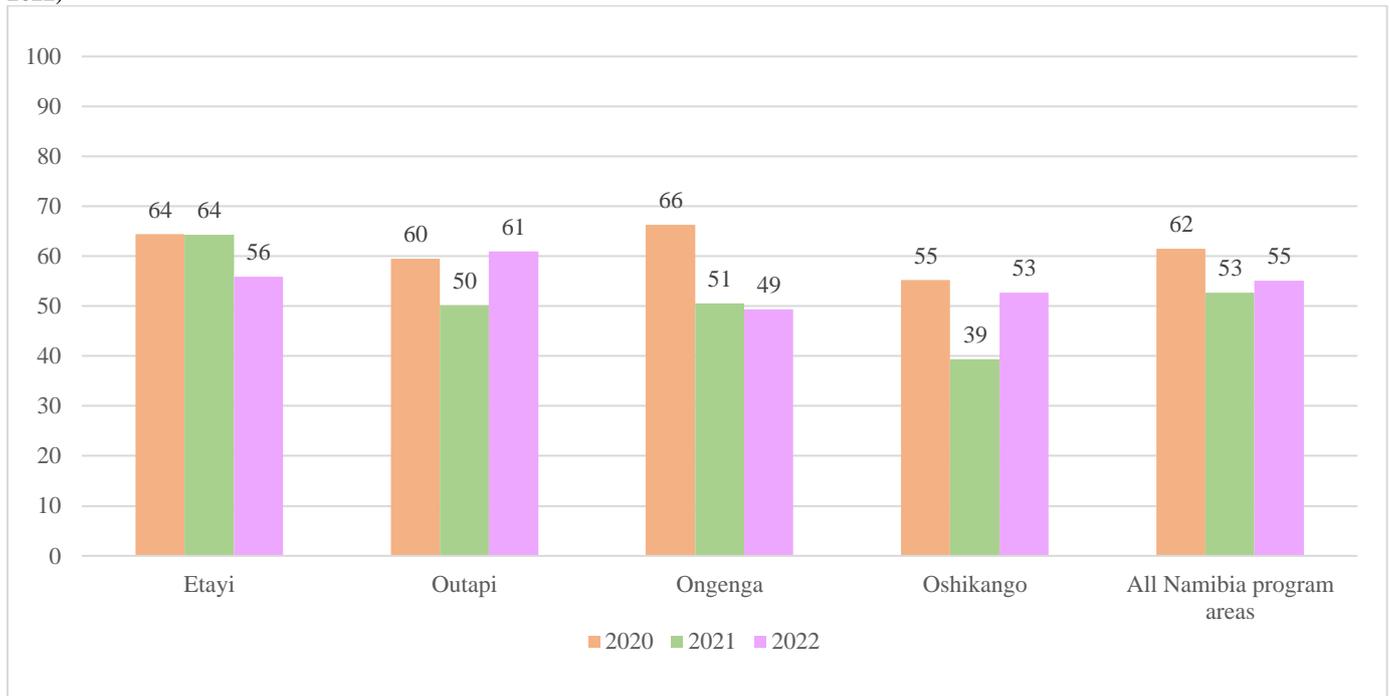


Figure 5. shows the proportion of children <5 who slept under an ITN the previous night from 2020-2022. Across all Namibia program areas in 2022, ITN use by children <5 the previous night decreased significantly from 64% in 2021 to 59% in 2022 ($p=0.004$). However, ITN use by children <5 the previous night is still higher than ITN use by the general population the previous night (44%, shown in Figure 1), indicating that, in general, children <5 are being prioritized to sleep under ITNs when there are not enough ITNs in the household to cover everyone who slept there. Among program areas at the Constituency level, ITN use by children <5 the previous night in 2022 ranged from 58% in Outapi program areas to 63% in Etayi program areas. The proportion of children <5 who slept under an ITN the previous night decreased significantly within Outapi program areas, from 68% in 2021 to 58% in 2022 ($p=0.01$).

Figure 5. Percent of children <5 who slept under an ITN the previous night, by program areas at the Constituency level (2020-2022)

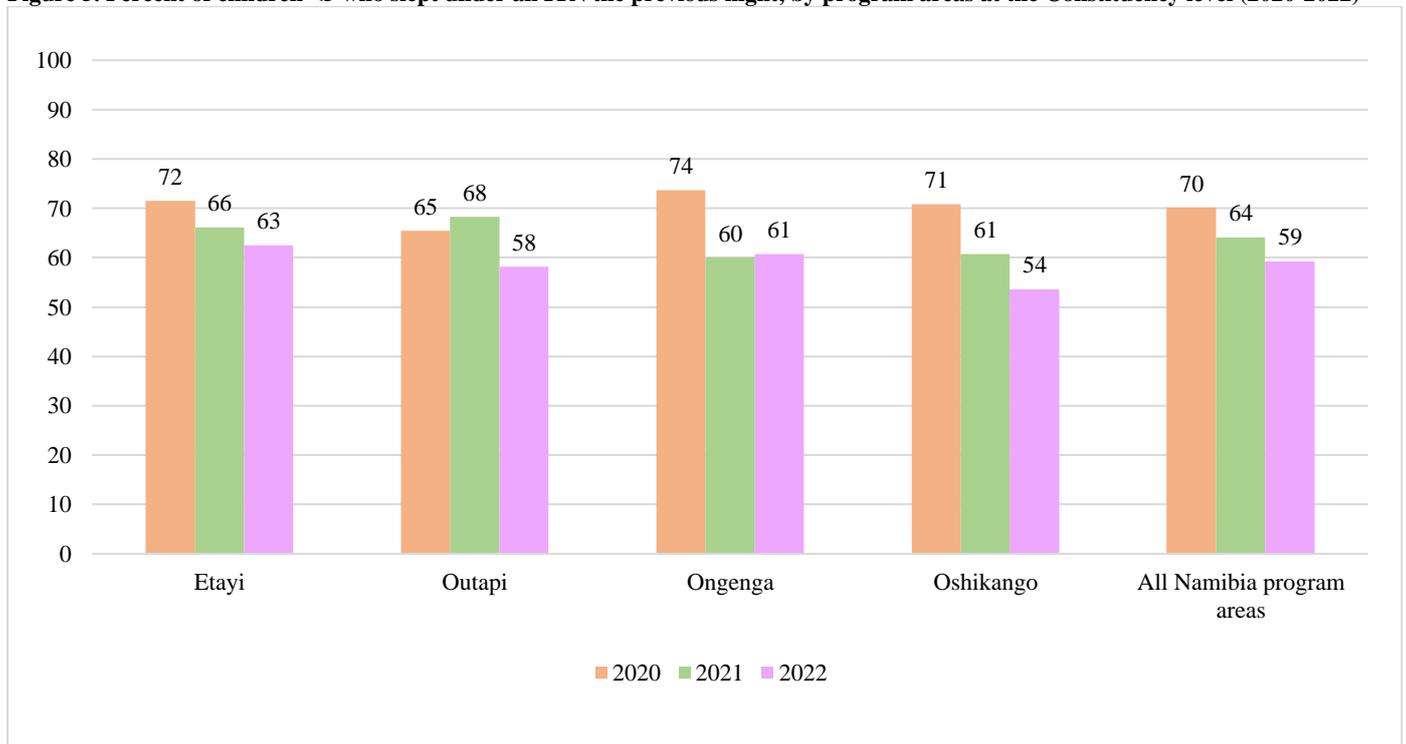


Figure 6 shows the proportion of people who slept under an ITN the previous night among all households, among households that own at least one ITN for every two people who slept there the previous night, and among households that own at least one good condition ITN for every two people who slept there the previous night. While only 44% of people used an ITN the previous night among all surveyed households in Namibia (regardless of their ITN ownership status), ITN use increased to 78% when looking only at households that own at least one ITN for every two people and increased further to 82% when looking only at households that own at least one good condition ITN for every two people. This suggests that most people will use ITNs if they have access to ITNs, especially access to ITNs in good condition. However, there are still about one-fifth of people who have access to an ITN (in any condition) but did not sleep under it the previous night.

Figure 6. Percent of people who slept under an ITN the previous night by household ITN ownership, by program areas at the Constituency level (2022)

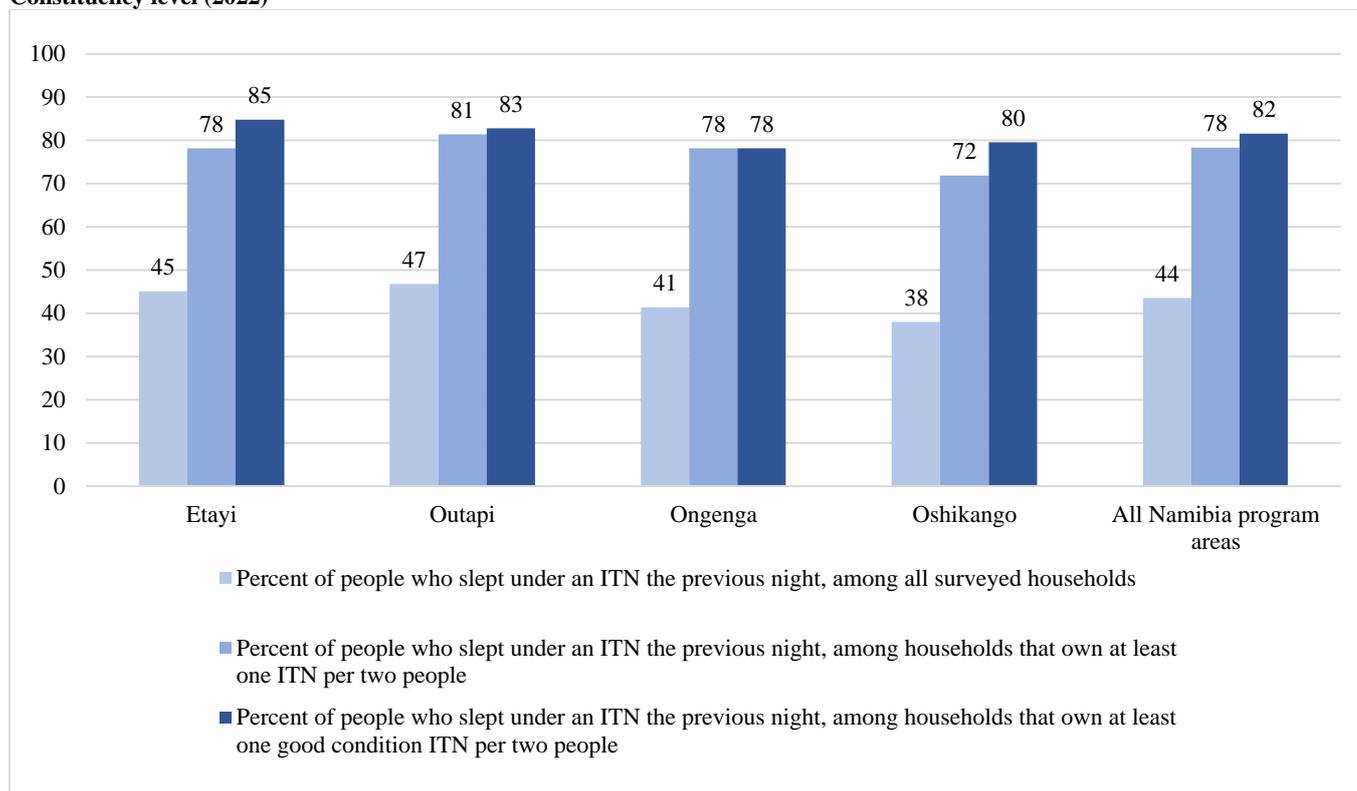


Table 7. shows ITN use (proportion of people who slept under an ITN the previous night) by pregnant women and children <5, as well as ITN use of the general population by varying levels of household ITN ownership: among all surveyed households, among households that own at least one ITN for every two people in the household, and among households that own at least one ITN in good condition for every two people in the household.

Table 7. ITN use by the general population, ITN use by pregnant women, ITN use by children <5, ITN use among households that own at least one ITN for every two people, and ITN use among households that own at least one good condition ITN for every two people, by program areas at the Constituency level (2022)

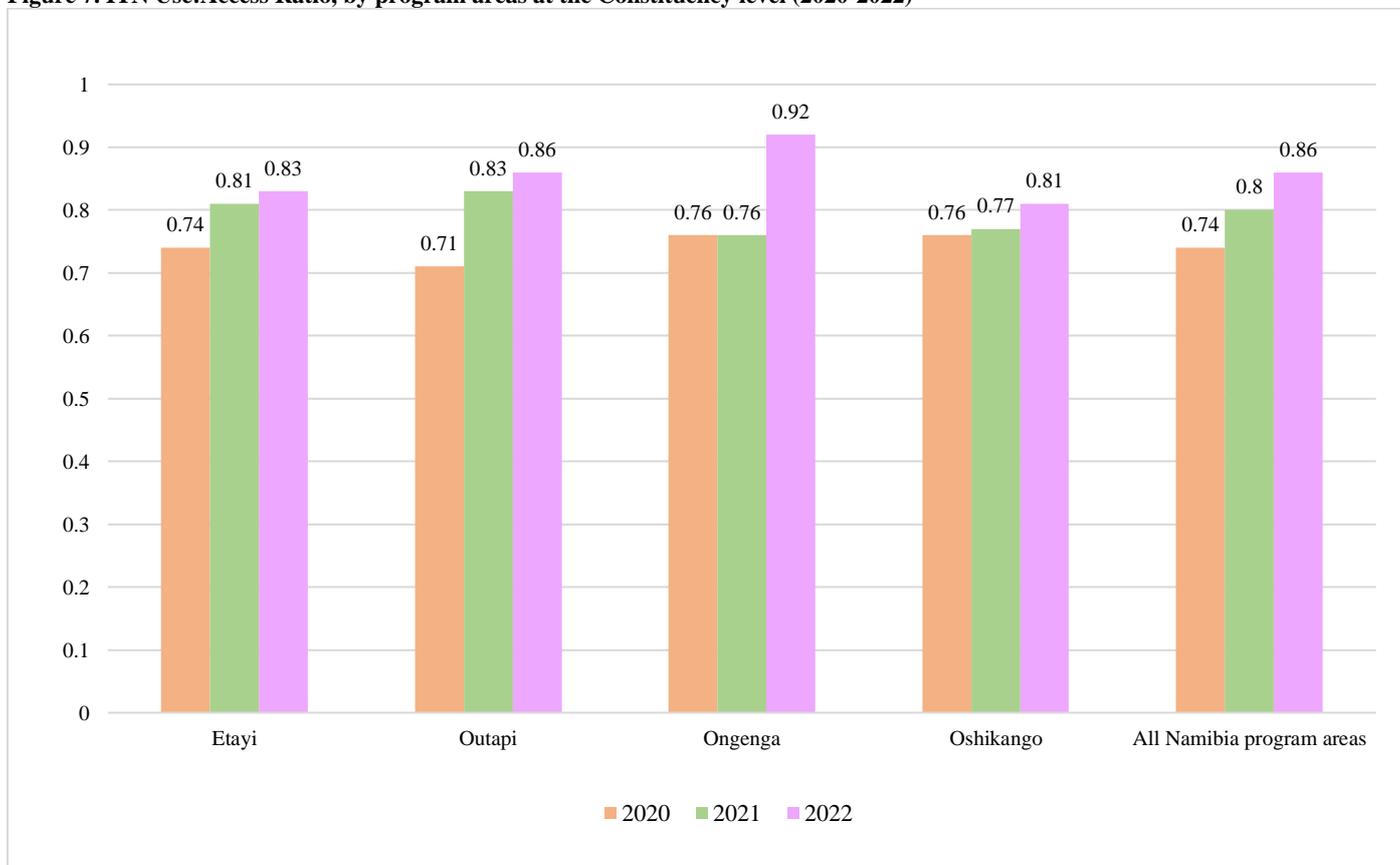
Region	Constituency	Percent of pregnant women who slept under an ITN the previous night (household average)	Percent of children <5 who slept under an ITN the previous night, (household average)	Percent of people (general population) who slept under an ITN the previous night (household average)	Percent of people who slept under an ITN the previous night, among households with at least 1 ITN for every 2 people (household average)	Percent of people who slept under an ITN the previous night, among households with at least 1 good condition* ITN for every 2 people (household average)
		%	%	%	%	%
Omusati	Etayi	56	63	45	78	85
	Outapi	61	58	47	81	83
Oshana	Ongenga	49	61	41	78	78
	Oshikango	53	54	38	72	80
All Namibia program areas		55	59	44	78	82

*good condition was defined as not having any holes larger than a thumb (reported)

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. ITN use is affected by many factors, but several authors have pointed out that the main reason for non-use is lack of access to a net (Eisele, et al. 2009) and not having enough nets for everyone in the household (Hetzl, et al. 2012). 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 7 shows the ITN Use:Access Ratio from 2020-2022. ITN Use:Access Ratios have increased each year between 2020-2022. Across all Namibia program areas, the ITN Use:Access Ratio increased significantly from 0.8 in 2021 to 0.86 in 2022 ($p < 0.001$). Among program areas at the Constituency level, the ITN Use:Access Ratio increased significantly in Ongenga program areas, from 0.76 in 2021 to 0.92 in 2022 ($p < 0.001$); all other changes at the Constituency level were non-significant. This indicates that desired ITN use behavior is relatively high and has even increased, despite a significant decrease in ITN ownership from 2021-2022 (shown in Figure 1). This suggests that most people will use ITNs if they have them, suggesting that access to ITNs is a main driver of ITN use. However, there is still some room for improvement in the behavior of sleeping under an ITN among those who have access to one.

Figure 7. ITN Use:Access Ratio, by program areas at the Constituency level (2020-2022)



Care-seeking behaviour

There are several key steps in the ideal trajectory of care 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 (three days). Each step in the trajectory of care presents an opportunity for children to be “missed” and therefore for malaria infections to be left untreated or possibly transmitted to others. While all these steps depend on both individual behavior choices and health system services, some steps rely more heavily on individual behavior (such as seeking care within 24 hours of fever onset) and others rely more heavily on the health system (such as giving a malaria test to a febrile child). The trajectory of care cascade, shown in Figure 8, helps to visualize where the gaps are in ideal care-seeking trajectory for children <5 with fever.

Respondents were asked if they were a mother or caregiver of a child <5, if their child had a fever within the previous two weeks, and details about the trajectory of care for that child with fever. Figure 9 shows the number of children <5 with fever at each step in the trajectory of care, which helps to illuminate the gaps in care. Across all Namibia program areas, the largest gap in the trajectory of care is seeking care *within 24 hours of the start of the fever*; among respondents whose child <5 had a fever in the previous two weeks, only 56% (113/203) sought care from a health facility or CHW within 24 hours of the fever onset (66 children missed). The second largest gap in the trajectory of care was receiving a malaria test from a health facility or CHW, only 57 of the 113 children who sought care from a health facility or CHW within 24 hours of the start of the fever received a malaria test.

Figure 8. Cascade of care-seeking behavior (number of respondents with children <5), all Namibia program areas (2022)

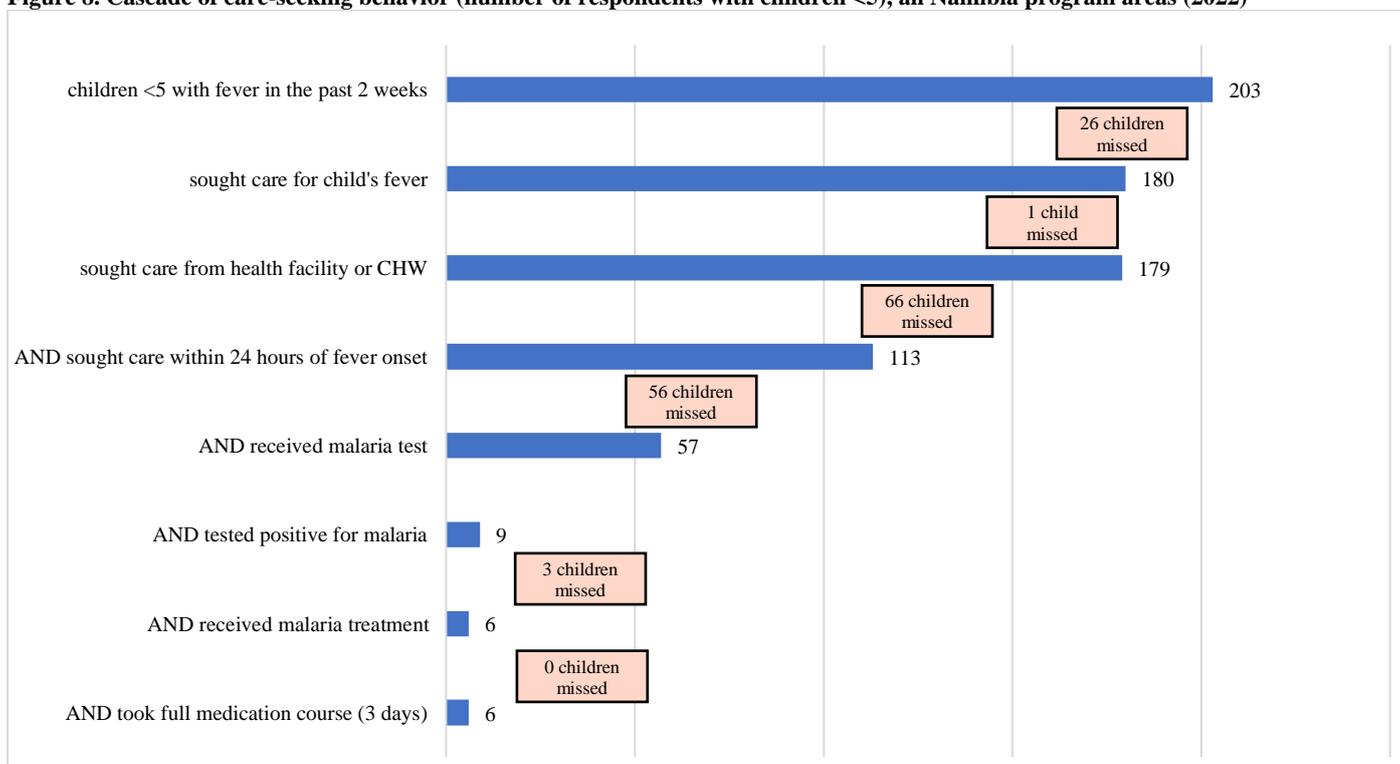


Figure 9 shows the proportion of children <5 with fever in the two weeks prior to the survey who sought care from a health facility or CHW within 24 hours of the start of the fever. Across all Namibia program areas, 56% of respondents who had children <5 with fever in the previous two weeks sought care from a health facility or CHW within 24 hours of the start of the fever, a significant decrease from 70% in 2021 (p=0.004). Among program areas at the Constituency level, the proportion of children <5 with fever who sought care within 24 hours decreased significantly in Etayi program areas (from 76% in 2021 to 50% in 2022, p=0.008) and in Outapi program areas (from 65% in 2021 to 43% in 2022, p=0.011), with non-significant changes observed elsewhere.

Figure 9. Percent of children <5 with fever who sought care from a health facility or CHW within 24 hours of the start of the fever, by program areas at the Constituency level (2020-2022)

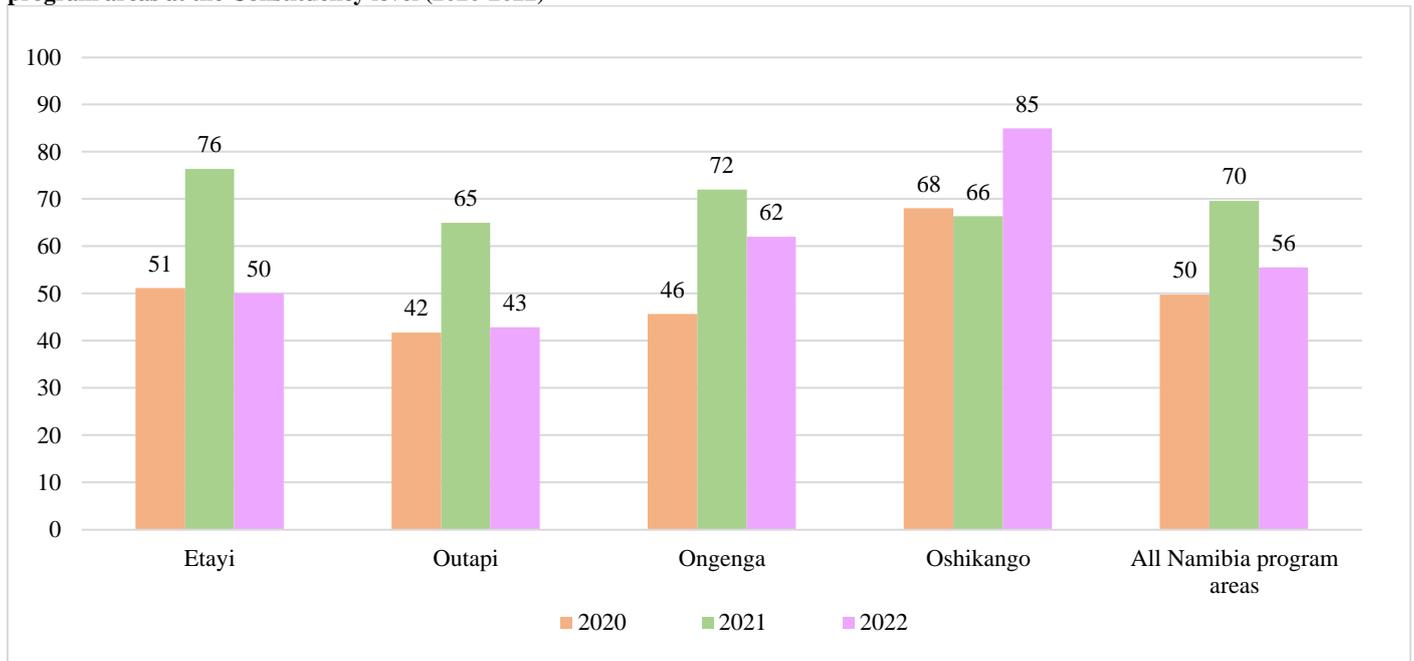
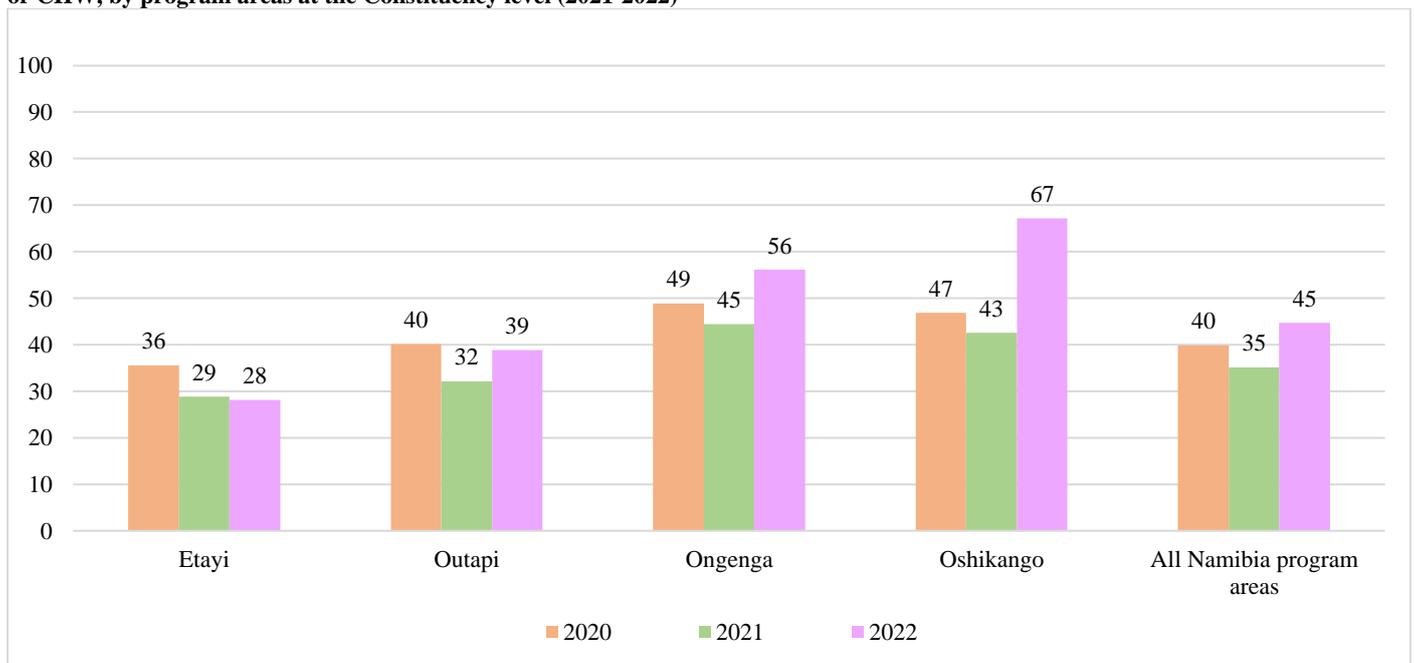


Figure 10. shows the proportion of children <5 who received a blood test for malaria, among those who sought care from a health facility or CHW. Across all Namibia program areas in 2022, 45% of children who sought care from a health facility or CHW received a blood test for malaria, a non-significant increase from 35% in 2021. None of the changes within program areas at the Constituency level were statistically significant, likely due in part to smaller subsamples of children <5 with fever who sought care from a health facility or CHW.

Figure 10. Percent of children <5 with fever who received a blood test for malaria, among those who sought care from a health facility or CHW, by program areas at the Constituency level (2021-2022)



Across all Namibia program areas, 12.6% (10/82) of children <5 with fever who were given a malaria test tested positive for malaria. Seven out of the 10 positive children received Coartem for malaria treatment.

Knowledge and attitudes

Respondents were asked several questions pertaining to their knowledge of fever as a symptom of malaria, malaria transmission, the possibility of death if malaria is left untreated, and the possibility of being infected with malaria without having symptoms.

Figure 11. shows the proportion of respondents who identified “fever” or “feeling cold/chills” as a symptom of malaria. Across all Namibia program areas, 83% of respondents identified “fever or “feeling cold/chills” as a symptom of malaria. Results ranged from 76% in Outapi program areas to 88% in Etayi program areas. Changes from 2021-2022 were non-significant at all levels.

Figure 11. Percent of respondents who identified “fever” or “feeling cold/chills” as a symptom of malaria, by program areas at the Constituency level (2020-2022)

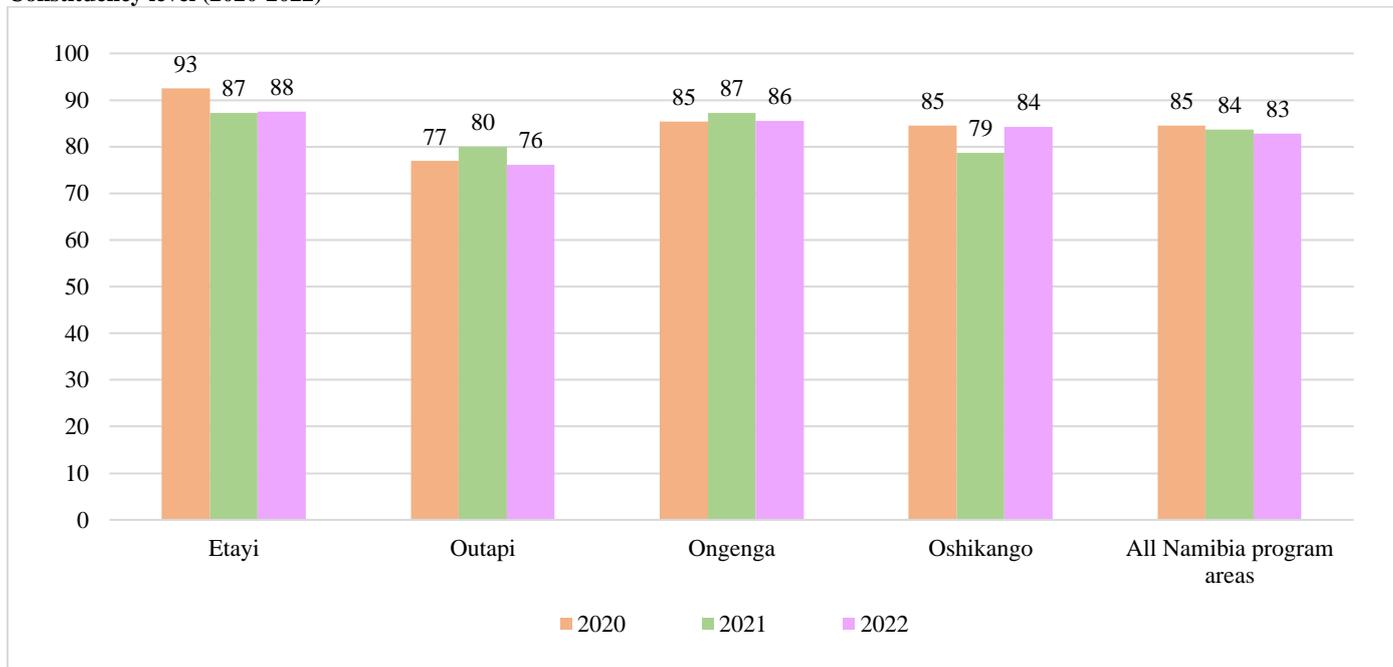
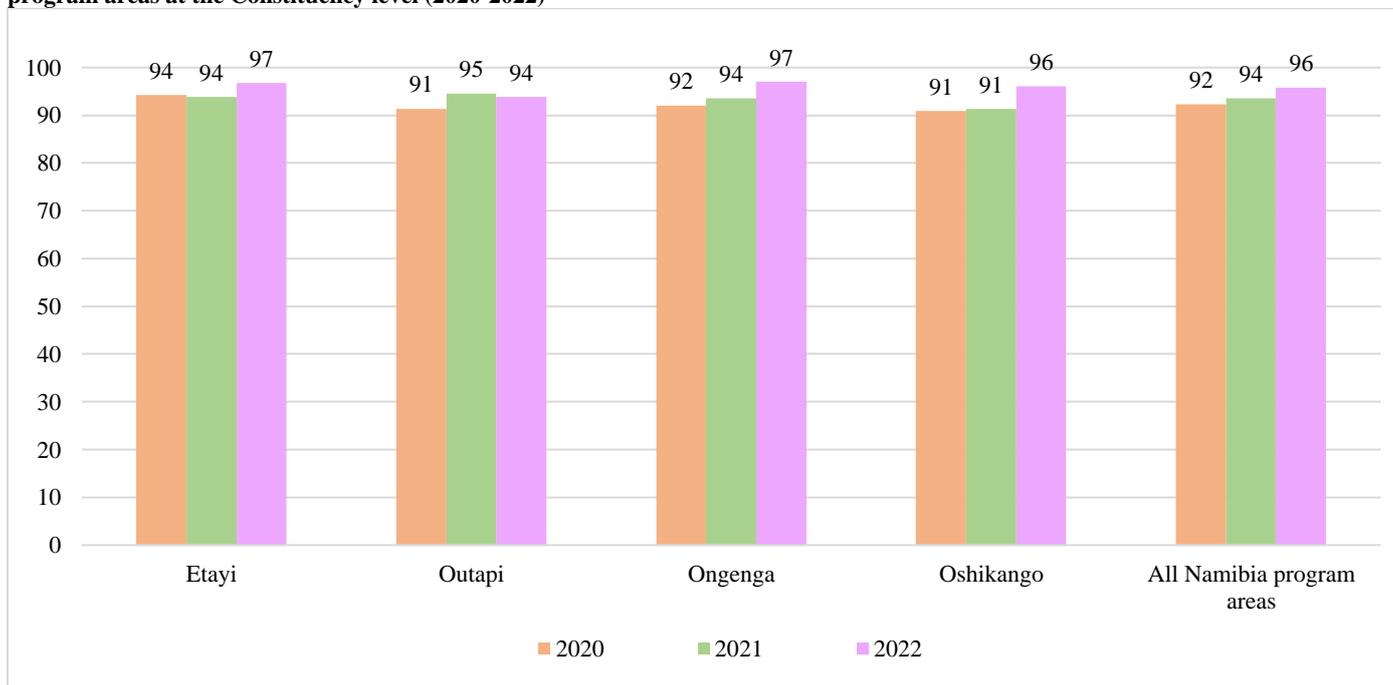


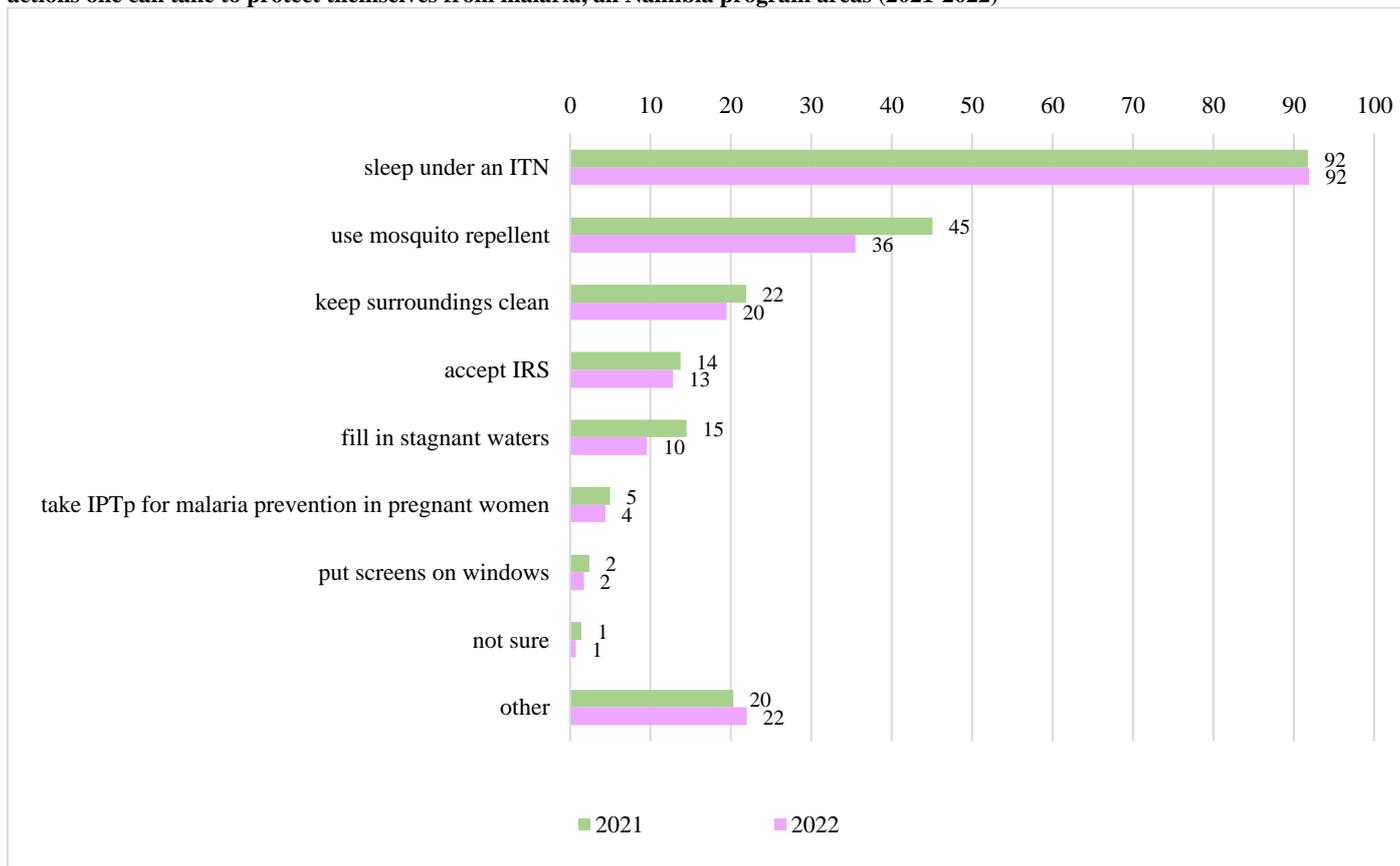
Figure 12. shows the proportion of respondents who identified the mosquito as the cause of malaria transmission and listed nothing else incorrect (e.g. getting soaked in the rain, eating unripe fruit, etc.). Across all Namibia program areas in 2022, the proportion of respondents who identified the mosquito as the cause of malaria transmission and listed nothing else incorrect increased significantly from 94% in 2021 to 96% in 2022 (p=0.002). Among program areas at the Constituency level, results ranged from 94% in Outapi program areas to 97% in Etayi and Ongenga program areas. From 2020-2021, significant increases were observed in Etayi program areas (from 94% in 2021 to 97% in 2022, p=0.032), Ongenga program areas (from 94% in 2021 to 97% in 2022, p=0.009), and in Oshikango program areas (from 91% in 2021 to 96% in 2022, p=0.017).

Figure 12. Percent of respondents who identified the mosquito as the cause of malaria transmission, and listed nothing else incorrect, by program areas at the Constituency level (2020-2022)



To shed light on knowledge of malaria prevention, respondents were asked if there were things one could do to protect oneself from malaria (97% believed there were). If the participant believed that there were things one could do to protect oneself from malaria, they were then asked to list off what came to mind as personal protective measures against malaria. Figure 13 shows the percent of respondents who reported various actions to protect oneself from malaria, among those respondents who did believe there were things one could do to prevent malaria. Among these respondents, 92% mentioned “sleep under ITNs”, 36% mentioned “use mosquito repellent,” and 20% mentioned “keep surroundings clean.” Of note, 22% of respondents said something other than what was listed, though data was not collected on what their response was.

Figure 13. Percent of respondents who reported various actions to protect oneself from malaria, among those who believe there are actions one can take to protect themselves from malaria, all Namibia program areas (2021-2022)



Respondents were asked whether they believed that ITNs and IRS “helps a lot,” “helps a little,” or “does not help” to prevent malaria. Table 8. shows these results from 2020-2022. No significant changes were observed between 2021-2022.

Table 8. Percent of respondents that believe that ITNs and IRS “help a lot” to prevent malaria, all Namibia program areas (2020-2022)

Province	HFCA	Percent of respondents who believed that ITN’s “help a lot” to prevent malaria			Percent of respondents who believed that IRS “helps a lot” to prevent malaria		
		2020	2021	2022	2020	2021	2022
Omusati	Etayi	98	97	98	76	79	79
	Outapi	98	97	91	79	72	69
Ohangwena	Ongenga	99	94	97	85	71	72
	Oshikango	95	94	93	77	77	70
All Namibia program areas		98	96	95	80	74	72

Appendix 1. 2022 KAP Survey sampling frame (NACDO program areas) and program areas that received IRS within 12 months prior to the 2022 KAP Survey

Region	Constituency	Village	Reportedly received IRS within the 12 months prior to the 2022 KAP Survey	
Omusati	Etayi	Onheleiwa		
		Oshilovafa		
		Oipanda		
		Ehafo		
		Omanghwi		
		Ohakadu		
		Onghuwo		
		Ongali		
		Oneheke B		
		Onaipwakola		
		Oneheke A		
		Efalehadi		
		Olyavakala		
		Oshatumbala		
		Ehanda		
		Omunyele		
		Okanhwa		
		Oshiyeleka		
		Oshitinamwene		
		Onamhindi		
		Olyavahenge		
		Ondobeyelao		
		Ohongo		
		Elakalapwa		
		Okandi		
	Eehongo			
	Odimbwa			
	Ondjuwoyamukulu			
	Oikokola			
	Onhepandaulo			
	Oshivanda			
		Outapi	Omakuva	YES – October 2021
			Onaholongo	
			Akalungu	
			Omidamba	
			Akati	
			Okahala	
			Omuulukila	
			Okuni	
			Omafa	
			Oufawahelia	
			Oshipumbu	
			Oiwiwili	
			Omalunda	
			Osisia	YES – October 2021
	Oukwandongo			
	Onavivi		YES – October 2021	
	Omufituwenghete			
	Oshiputusheendjamba			
	Okafakoishongo			
	Okafitukeonde			
	Ouwanghala			
	Olukekete			
	Omikwayanghwi			
	Omufitu weelo			
	Okatanyange			
	Okahwakamau			
	Oinghuzi			
	Oikwayaiyezi			
	Okahwakambandjele			
	Oipanda			
	Eehama vaShinanhi			
	Okahwa kaShangolo			
	Ohama- Yashuuda			
	Oshikwanailya			
	Onaitembu	YES – October 2021		
	Oshihwa-shekwa			
	Ohamuyala			
	Ohauhwe			
	Oshihwa-shaaluholo			
Ohangwena	Ongenga	Onangama A		
		Onangama B		
		Eenghoshi A		
		Eenghoshi C		
		Oshindobe Hakandonga		

Region	Constituency	Village	Reportedly received IRS within the 12 months prior to the 2022 KAP Survey
		Eembwakuni	
		Ohadiwa Kaula	
		Ohadiwa yaShanghala	
		Ohadiwa yaShindinge	
		Eenghoshi B	
		Ohadiwa yaHaimbodi	
		Okalondo	
		Onangama C	
		Okafitu	
		Onawa	
		Oimwandi	
		Ongenga	
		Ohadiwa yaHamakali	
		Ondobeyomunghudi A	
		Oshikwiyu	
		Oshali D. Haipopya	
		Okalyafengwa	
		Oshali shaShiweda	
		Ondobeyomunghudi B	
		Oshindobe B	
		Oshindobe A	
		Eengwena B	
		Eengwena C	
		Eengwena A	
		Okambebe	
		Oshali shaAmbrosius	
		Omufitu waNakashole	
		Ofaitumbo	
		Eengava	
		Onghala A	
		Okalondo kakakaya	
		Onghala B	
		Elakalapwa	
		Oikoto	
		Eengwe	
		Oshali shaPeelo	
		Omatangela A	
		Omatangela B	
		Omholo	
		Eenghudi	
		Onakaolo	
		Obenoni	
Eembo			
Oimbandalunga			
Oshikango	Oshikango	Onanghwe	
		Okadiva 2	
		Okadiva 1	
		Oyongo	
		Odibo	
		Oshikango	
		Onamhinda	Yes – December 2021
	Okatale		

Appendix 2. 2022 KAP Survey Results for new NACDO program areas within Okongo and Oshikunde Constituencies

Background and methods

In late 2021, new program areas were established within Okongo and Oshikunde Constituencies within Ohangwena Region (Table 1). Since these program areas were not surveyed in 2021, the 2022 KAP Survey served as their baseline and first year of data collection. The sample sizes for the new program areas were determined with the aim of accurately estimating measurements for the following indicators: the proportion of households with at least one unused net and one uncovered person, and the proportion of children <5 with fever in the previous two weeks who sought care from a health facility or CHW within 24 hours of the start of the fever. Standard sample size calculations for dichotomous outcomes were performed based on expert opinion regarding the likely true population proportions of the indicators in the new areas and desired margins of error around each planned estimate. The largest resulting sample size amongst the three indicators was selected as the required minimum sample size. All other background and methodology for the 2022 KAP Survey in these new program areas is the same as described in Sections 2 and 3 of this report.

Table A2.1. “New” IFCBMI program areas within Okongo and Oshikunde Constituencies, sampling frame for baseline KAP Survey

Region	Constituency	Village	Reportedly received IRS within the 12 months prior to the 2022 KAP Survey
Ohangwena	Okongo	Oshalande	Yes – December 2021
		Oshalunghima	Yes – December 2021
		Ekoka	Yes – December 2021
		Ohenghombo	
		Oshalumbu	Yes – January 2022
		Onhuli	
		Ehafo	Yes – January 2022
		Olukula	Yes – December 2021
		Ongalangobe	Yes – December 2021
		Okongo	
		Ohameva	Yes – January 2022
		Emuwike	
		Okalunga/Onamata	Yes – December 2021
		Oluhapa	
		Omulamba A	
		Ombuudiya	
		Oshuudiya (Shapopi)	
		Onheleiwa	
		Omauni # 1 & 2	Yes – December 2021
		Onhehanga	
		Omushiyo	
		Enyana	
		Omboloka	Yes – December 2021
		Oshamukweni	Yes – January 2022
	Oshamambo		
	Kumininenge	Yes – December 2021	
	Ohangwena	Onamafila	
		Oshifitu	Yes – January 2022
		Oshambada	
		Emanya	
		Ondobe Yelao	
		Oshitayi	
Oshilambwili			
Ombuumbu			
Embwanyana			
Oluwaya			

Results

Table A2.2. Sample sizes (2022)

Region	Constituency	Sample size
Ohangwena	Okongo	250
	Oshikunde	72

Table A2.3. Background characteristics (2022)

Background characteristic	Okongo Constituency program areas	Oshikunde Constituency program areas
Average age of respondent	37.4	36.8
Percent of households with at least 1 child under 5 who slept there the previous night	96	99
Average number of children <5 in household the previous night, among households with at least one child <5	1.9	2.3
Percent of households with at least one pregnant woman who slept there the previous night	15	13
Average number of people who slept in the household the previous night	11	8.0
Average number of sleeping spaces	4.9	5.6
Percent of households with surrounding standing water (per visual observation of data collector)	18	33

Table A2.4. Respondent education level (2022)

Education level (%)	Okongo Constituency program areas	Oshikunde Constituency program areas
Never attended school	13	7
Attended some primary school	26	20
Completed primary school	21	18
Attended some secondary school	30	42
Completed secondary school	8	14
Higher than secondary school	1	0
Not sure	0	0

Table A2.5. Results for insecticide treated nets (ITNs)

Indicator	Okongo Constituency program areas		Oshikunde Constituency program areas	
	Percent	Number	Percent	Number
Ownership of ITNs				
Percent of households that own at least one ITN (%)	62		65	
Percent of households that own at least one ITN in good condition (defined as not having any holes larger than a thumb, reported not observed) (%)	55		54	
Percent of households that own at least one ITN for every two people that slept in the household the previous night (%)	14		17	
Percent of households that own at least one ITN in good condition for every two people that slept in the household the previous night (%)	12		11	
Average number of ITNs per household (n)	1.3		1.7	
Access of ITNs				
Percent of people with access to an ITN within their own household (assuming each ITN covers two people) (%)	40		41	
Percent of people with access to a good condition ITN within their own household (assuming each ITN covers two people) (%)	34		34	
Use of ITNs				
Percent of people who slept under an ITN the previous night (%)	31		32	
Percent of pregnant women who slept under an ITN the previous night (%)	25		44	
Percent of children <5 who slept under an ITN the previous night (%)	40		42	
Percent of people who slept under an ITN the previous night, among households that own at least one ITN per two people (%)	72		76	
Percent of people who slept under an ITN the previous night, among households that own at least one good condition ITN per two people (%)	76		84	
ITN Use:Access Ratio (n)	0.78		0.84	

Table A2.6. Results for indoor residual spraying (IRS)

Indicator	Okongo Constituency program areas		Oshikunde Constituency program areas	
	Percent	Number	Percent	Number
Households that received IRS within the previous 12 months, among those located in areas that reportedly received IRS in the most recent vector control campaign	71	n=84	82	n=9
Households that gave the following reasons for not receiving IRS within the previous 12 months, among households that were not sprayed but were located in areas that reportedly received IRS within 12 months prior to the survey:				
No one came to my household to offer IRS	76	n=26	100	n=2
I was not at my household when IRS was offered	6	n=2	0	n=0
I refused IRS	0	n=0	0	n=0
My household is ineligible for IRS	0	n=0	0	n=0
Not sure	20	n=6	0	n=0

Table A2.7. Results for care-seeking behavior of children <5 with fever in the previous two weeks

Indicator	Okongo Constituency program areas		Oshikunde Constituency program areas	
	Percent	Number	Percent	Number
Respondents with children <5 who had fever in the previous two weeks	22	n=53	28	n=20
Respondents who sought care for their child <5 with fever from a health facility or CHW	88	n=45	100	n=20
Respondents who sought care for their child <5 with fever from a health facility or CHW within 24 hours of the start of the fever	76	n=38	85	n=17
Children who received a malaria test, among those who sought care from a health facility or CHW (regardless of timing in relation to fever onset)	49	n=22	45	n=9
Children who tested positive for malaria, among those who were tested for malaria by a health facility of CHW	14	n=3	11	n=1
Children who received Coartem for malaria treatment, among those who tested positive for malaria	100	n=3	100	n=1

Table A2.8. Results for malaria-related knowledge and attitudes toward ITNs and IRS

Indicator	Okongo Constituency program areas	Oshikunde Constituency program areas
	Percent	Percent
Respondents who identified “fever” or “feeling cold/chills” as a symptom of malaria	75	90
Respondents who identified the mosquito as the cause of malaria transmission, and listed nothing else incorrect	90	97
Respondents who believe that malaria can be deadly if left untreated	96	99
Respondents who believe that it’s possible to be infected with malaria without having symptoms	62	67
Composite knowledge indicator (answered all four knowledge questions correctly)	47	58
Respondents who believe that ITNs “help a lot” to prevent malaria	95	97
Respondents who believe that IRS “helps a lot” to prevent malaria	82	76

Appendix 3. References

- Eisele, Thomas, Joseph Keating, Megan Littrell, and Kate Macintyre. 2009. "Assessment of insecticide-treated bednet use among children and pregnant women across 15 countries using standardized national surveys." *Am J Trop Med Hyg* 80(2): 209-14.
- Hetzel, Manuel, Gibson Gideon, Namarola Lote, Leo Makita, Peter M Siba, and Mueller Ivo. 2012. "Ownership and usage of mosquito nets after four years of large-scale free distribution in Papua New Guinea." *Malaria Journal* 11:192.
- 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.