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

Results from 2024 KAP Survey within the program areas of

Isdell:Flowers Cross Border Malaria Initiative (IFCBMI) of the Namibia Anglican Community Development Organization (NACDO)

Data collected between 20 May – 5 July 2024

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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 "Isdell:Flowers / TKMI"), 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 2024 KAP Survey. Results are representative of Isdell:Flowers / TKMI program areas and cannot be directly extrapolated to the Constituency, Regional, or National levels since Isdell:Flowers / TKMI 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 2024 KAP Survey Results:

Indoor residual spraying (IRS)

The World Health Organization (WHO) recommends that ≥85% of households within a targeted area receive IRS in order for IRS to be most effective. All participants were asked if their household received IRS within the previous 12 months. Pasty 12-month household IRS coverage ranged widely from 31% of households in Ongenga Constituency program areas to 92% of households in Omundaungilo and Ondobe Constituency program areas. 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."

Insecticide treated nets (ITNs)

ITN Ownership was low; across all program areas, 56% of households owned at least one ITN and only 19% owned enough ITNs to cover everyone in the household (defined as at least one ITN for every two people in the household). Accordingly, ITN use was also low; 30% of people (household average) reported sleeping under an ITN the night before the survey. Pregnant women and children <5 slept under ITNs the previous night at slightly higher levels than the general population (38% and 42%, respectively), though the large majority still unprotected. Among those who already own ITNs, most slept under it the night before the survey, though there is room for net use behaviour improvement in some program areas.

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 gap in the care seeking trajectory is seeking care promptly (within 24 hours of fever onset). While 86% (155/181) of children <5 with fever in the past two weeks sought care from a health facility or CHW, only 55% (99/181) did so within 24 hours of fever onset. 57% 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 (regardless of timing).

Knowledge and attitudes

Knowledge of the mosquito as the cause of malaria transmission and knowledge that malaria could be deadly if left untreated were high across all program areas (96% and 98%, respectively). Knowledge of "fever" or "chills" as a symptom of malaria was also relatively high (84%), but some room for improvement The lowest knowledge level was the belief that it is possible to be infected with malaria without having symptoms (78%). 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.

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 "Isdell:Flowers / TKMI"), 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 147 community malaria volunteers (CMV) and 35 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 Isdell:Flowers / TKMI 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 2024 KAP Survey. Results are representative of Isdell:Flowers / TKMI 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 Isdell:Flowers / TKMI program areas included in the 2024 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 2024 KAP Survey included most Isdell:Flowers / TKMI program areas in Namibia (Appendix 1). The 2024 sample size was determined to be a minimum of 2600 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. Data was collected between 20 May and 5 July 2024.

Table 1. Namibia KAP Survey sample sizes (2024)

Region	Constituency	Sample sizes
Ohangwena	Ongenga	698
	Oshikango	423
	Okongo	967
	Oshikunde	197
	Omundaungilo	160
	Ondobe	222
TOTAL		**2667**
Response rate		**100%**

Household selection

Households were sampled by systematic random sampling. A "skip pattern" was calculated such that for a sampling frame of H households comprising Isdell:Flowers / TKMI 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. Data was analyzed in STATA v 14.2.

Section 4. Results

Results are representative of Isdell:Flowers / TKMI 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.

Table 32 Background characteristics, all program areas combined (2024)

Background characteristic	
Average age of respondent (n)	40
Households with at least one child under 5 who slept there the previous night (%)	81%
Average number of children <5 in household the previous night, among households with at least one child <5 (n)	1.6
Households with at least one pregnant woman who slept there the previous night (%)	12%
Average number of people who slept in the household the prior night (n)	6.8
Average number of sleeping spaces (n)	5.3
Households with surrounding standing water, per visual observation of data collector (%)	20%

Table 3. Respondent education level, all program areas combined (2024)

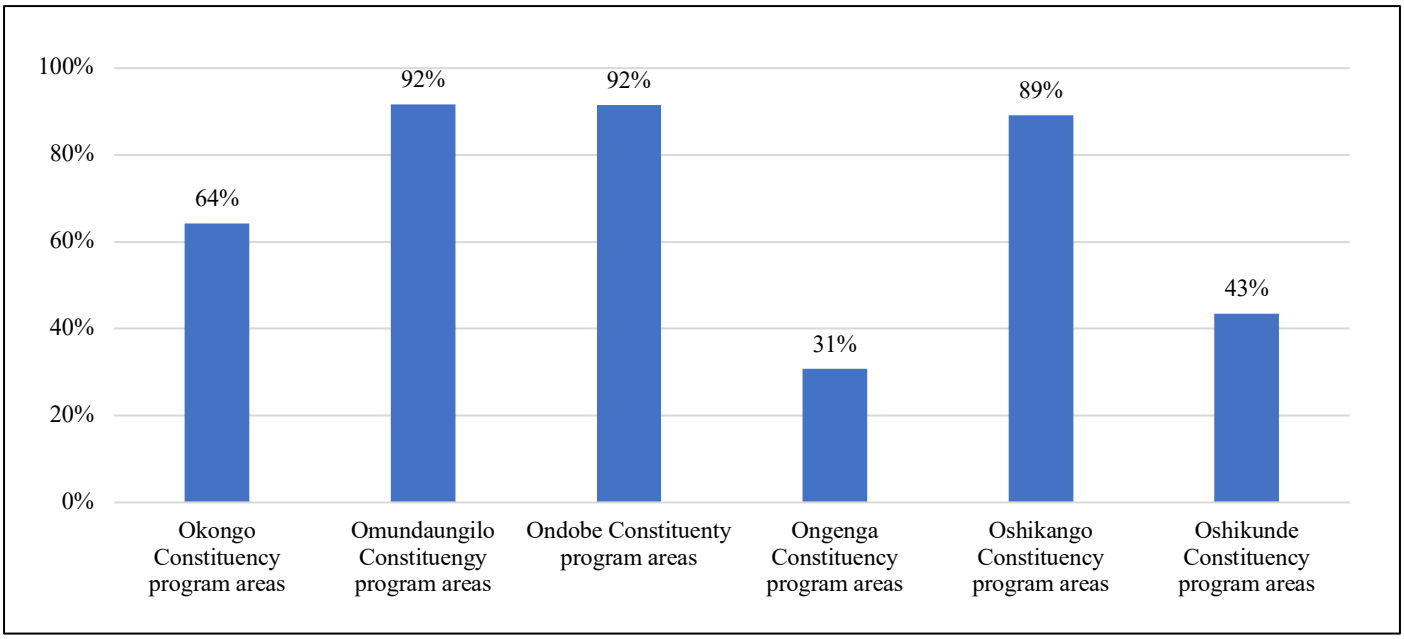
Education level	%
Never attended school	10%
Attended some primary school	26%
Completed primary school	21%
Attended some secondary school	31%
Completed secondary school	9%
Higher than secondary school	3%
Not sure	0%

Indoor residual spraying (IRS)

Figure 1. shows the percent of households that reported receiving IRS within 12 months prior to the 2024 KAP Survey, among program areas within program areas that were targeted to receive IRS within that timeframe.

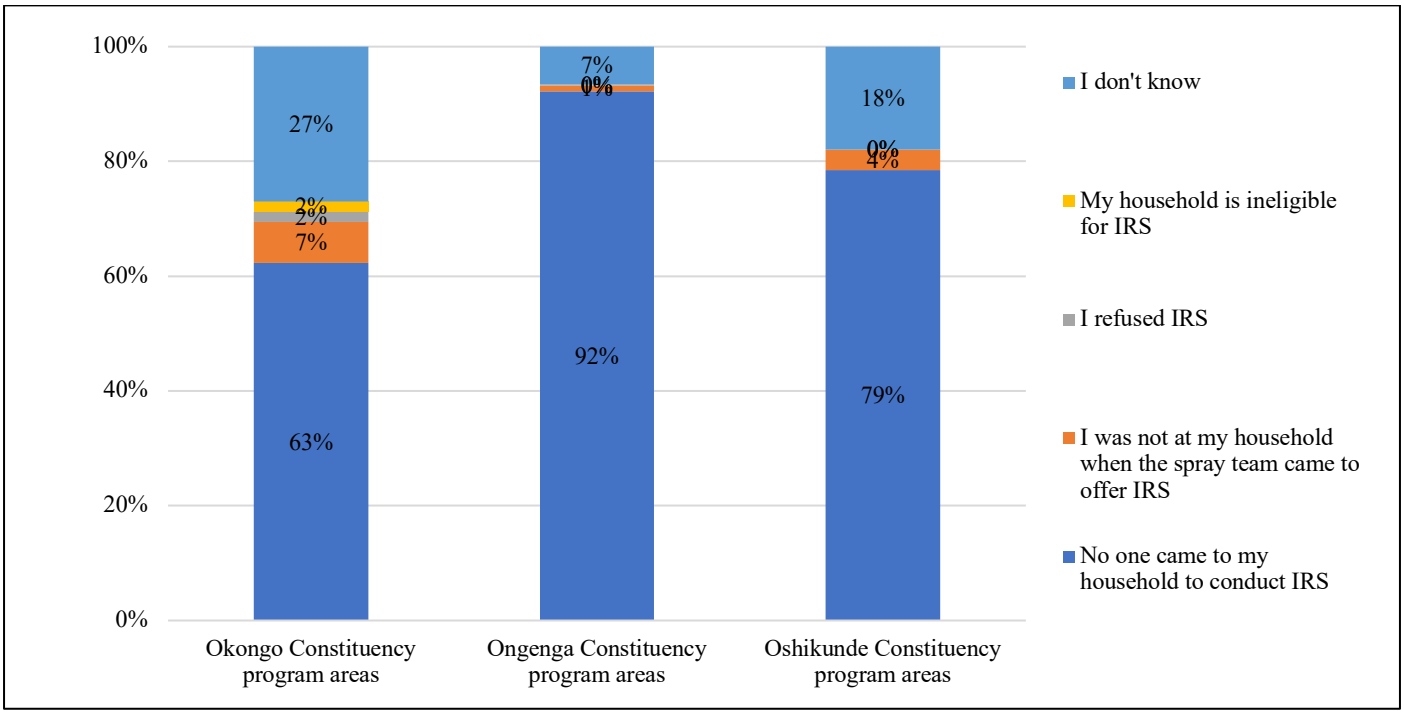
The World Health Organization indicates that at least 85% of households within a targeted area must receive IRS in order for IRS to be most effective. The 2024 KAP Survey results showed that past-12 month household IRS coverage reached the WHO-recommended level of ≥85% within program areas targeted to receive IRS in Omundaungilo (92%), Ondobe (92%) and Oshikango (89%) Constituencies. However, program areas within Okongo (64%), Ongenga (31%), and Oshikunde (43%) Constituencies did not meet this benchmark.

Figure 1. Percent of households that received IRS within 12 months prior to the survey (2024)



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. Figure 2 shows these reasons among program areas in Okongo, Ongenga, and Oshikunde Constituencies. The most common reason given for not receiving IRS was "no one came to my household to offer IRS."

Figure 2. Percent of households that reported various reasons for not receiving IRS, among households that reported not receiving IRS within the prior 12 months (2024)



Insecticide treated nets (ITNs)

All participants were asked about their household's ITN ownership and use of ITNs the night before the survey among household members. Household average of access to ITNs was calculated using the number of ITNs and the number of people in each household, and assumes that each ITN covers two people.

Figure 3. shows household ITN ownership. Across all program areas, 56% of households owned at least one ITN and 52% of households owned at least one ITN in good condition. 19% of households owned at least one ITN for every two people in the household and only 15% 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 3. Percent of households owning ITNs in various quantities and conditions (2024)

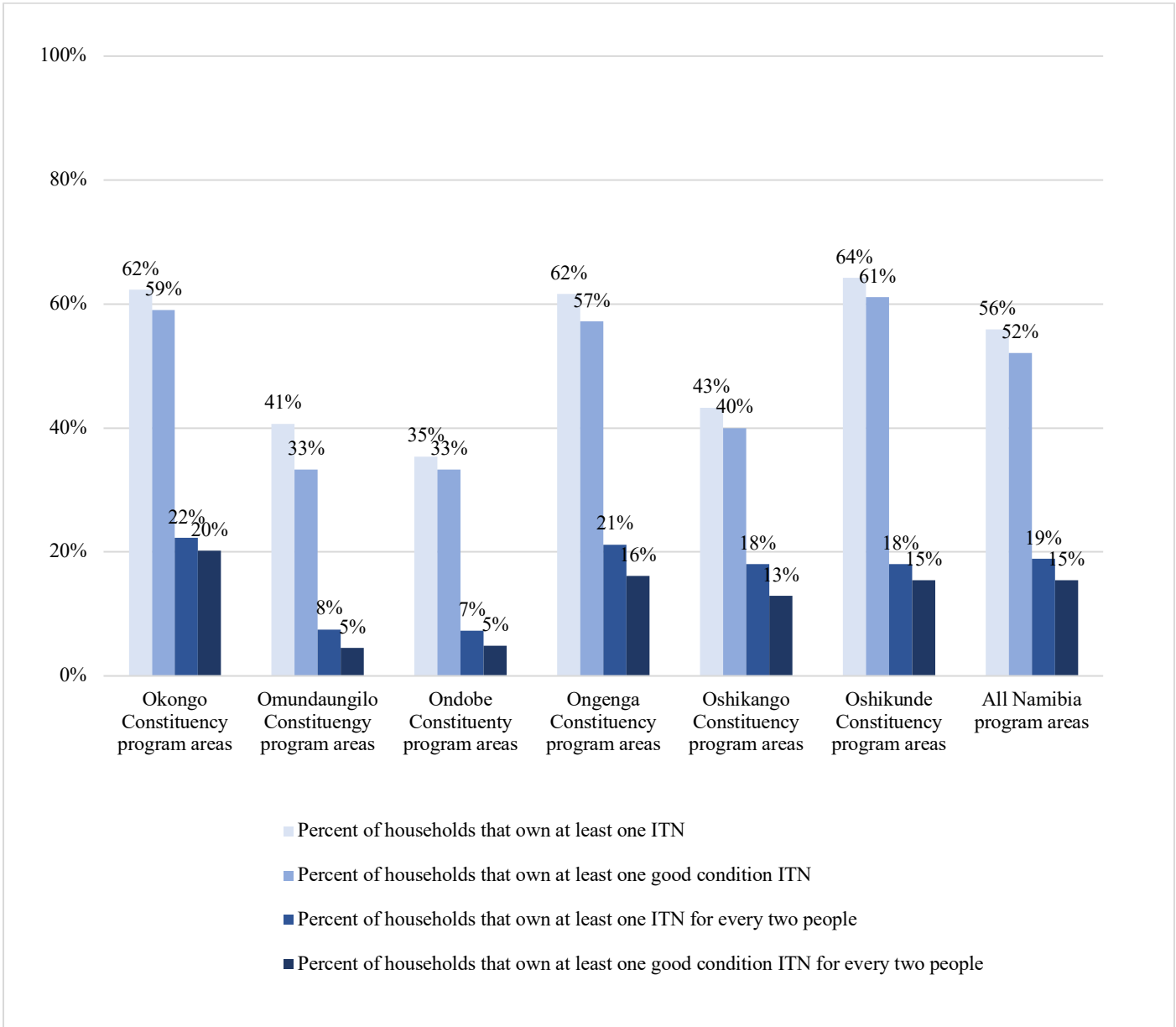
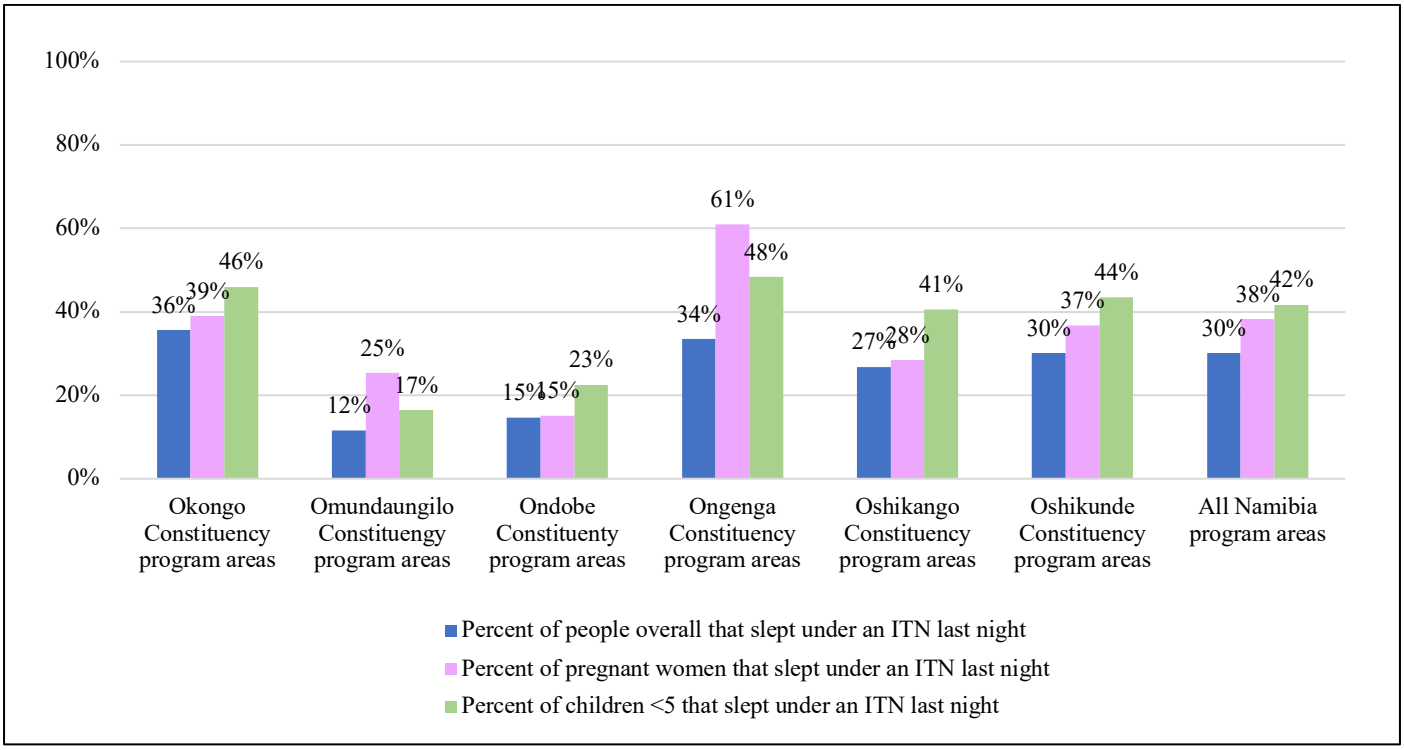


Figure 4. shows the percent of people overall who slept under an ITN the previous night (household average, the percent of pregnant women who slept under an ITN the previous night, and the percent of children <5 who slept under an ITN the previous night. Across all program areas, 30% of people overall, 38% of pregnant women, and 42% of children <5 slept under an ITN the night before the survey. Though pregnant women and children <5 are nowhere near fully covered by ITNs, in all program areas pregnant women and children <5 slept under ITNs at equivalent or higher levels than the general population, suggesting that these groups are being prioritized to sleep under ITNs when there aren't enough ITNs to cover everyone in the household.

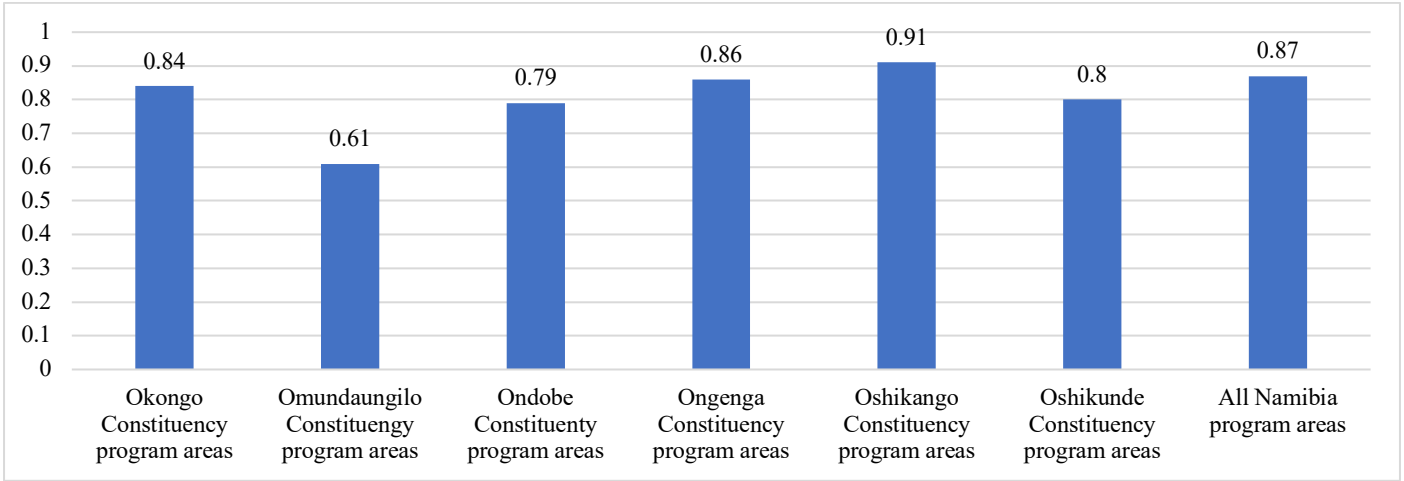
Figure 4. Percent of people (household average), percent of pregnant women, and percent of children <5 who slept under an ITN the previous night (2024)



It is clear from Figure 3 that ITN ownership (and therefore ITN access) is low, and it is clear from Figure 4 that ITN use is low. Figure 5 (below) shows the ITN Use:Access Ratio (Koenker and Kilian 2014), which is a recommended indicator to better understand if poor ITN use behaviour (e.g. not utilizing an ITN that the household already owns) is contributing to the low ITN use. Ratios below 0.80 indicate that there is room for behaviour change, meaning that there were some available ITNs that went unused when someone could have been sleeping under it. Ratios above 0.80 indicate that there is likely only a small amount of room for improvement in the behaviour of sleeping under an ITN. Ratios of ITN use to ITN access above 1.0 indicate that more than two people are sharing a net, on average.

Across all program areas, the ITN Use:Access Ratio was 0.87. Among program areas at the Constituency level, the ITN Use:Access ratio was lowest in Omundaungailo Constituency program areas (0.61) and second lowest in Ondobe Constituency program areas (0.79), suggesting that there could be an improvement in ITN use behaviour in those areas.

Figure 5. ITN Use:Access Ratio (2024)

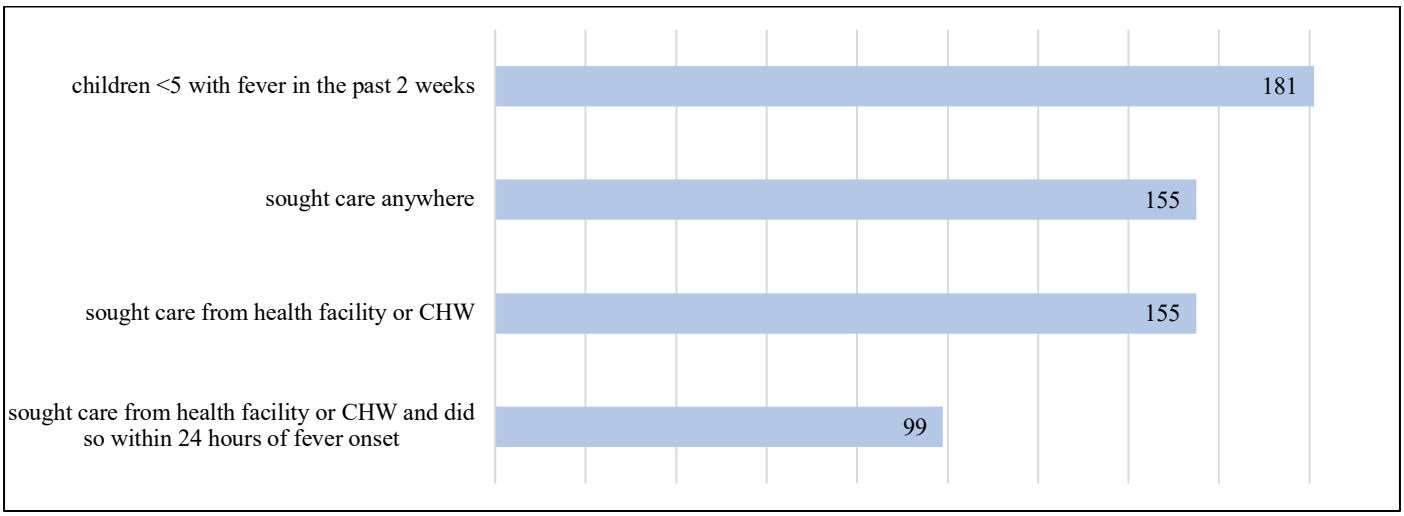


Care-seeking behaviour

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) 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.

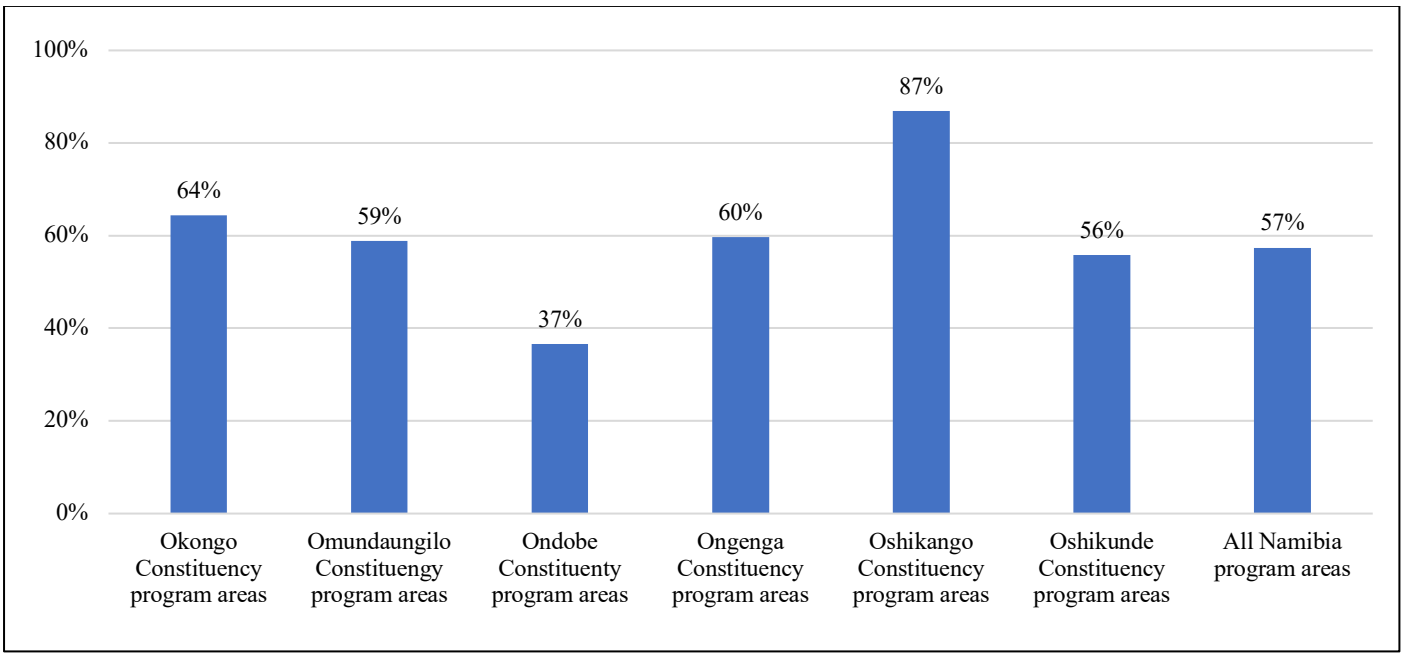
Figure 6 shows that prompt care-seeking (specifically, within 24 hours of fever onset) was the largest gap in the care-seeking trajectory of children <5 with fever in the past two weeks. While 86% (155/181) of children <5 with fever in the past two weeks sought care from a health facility or CHW, only 55% (99/181) did so within 24 hours of fever onset. Secondly, 14% (26/181) did not seek care anywhere for their fever. All those who did seek care (151/181) sought care from a health facility or CHW.

Figure 6. 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, all program areas combined (2024)



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 cause by malaria or by something else. Figure 7. shows the 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 (regardless of when care was sought). Across all program areas, 57% (89/155) 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 89 children who received a malaria test, 7 reportedly tested positive for malaria and 6 of those reported receiving Coartem for malaria treatment (not shown in graphical format).

Figure 7. 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, all program areas combined (2024)



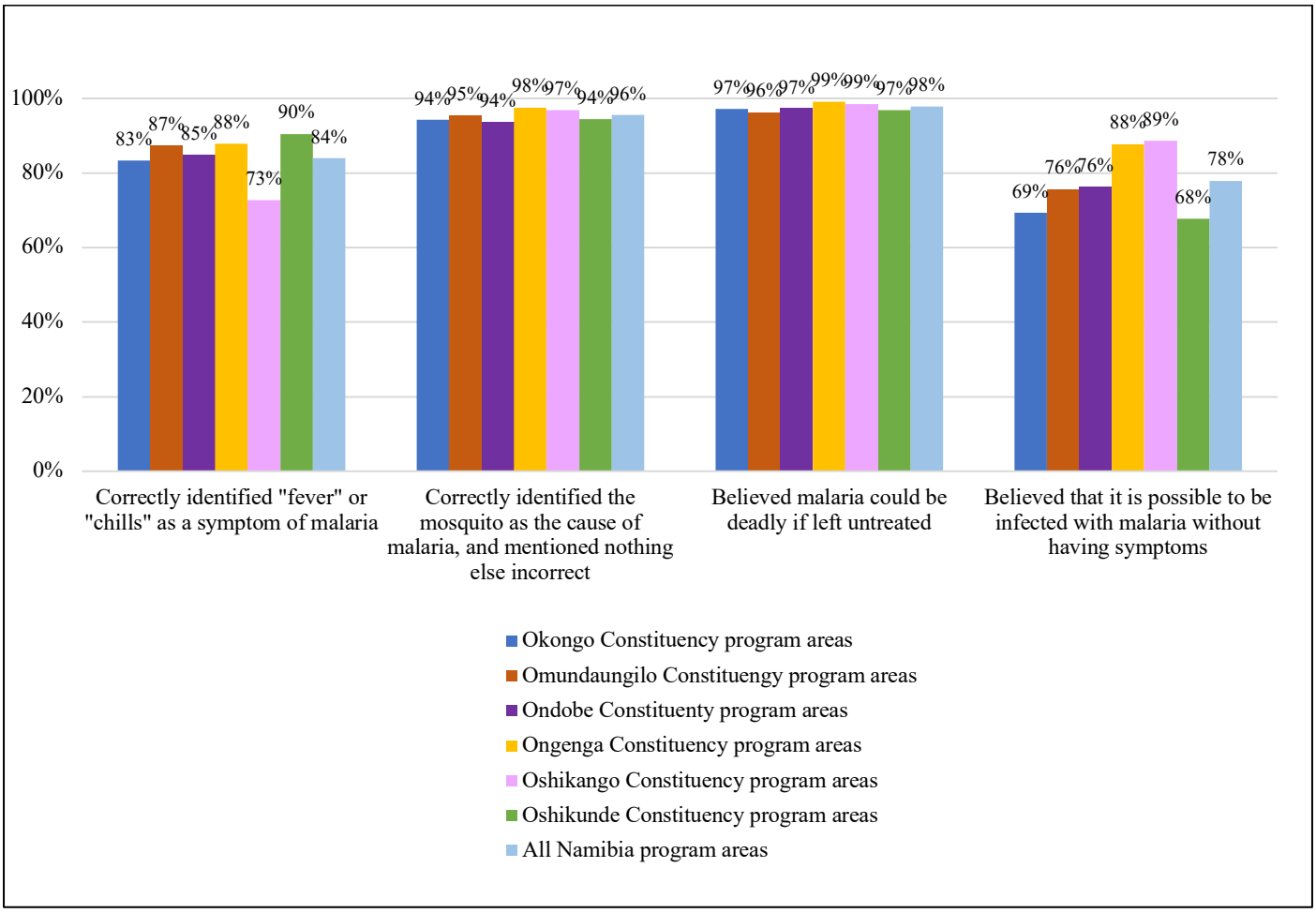
Knowledge and attitudes

Respondents were asked questions pertaining to their knowledge of malaria symptoms, cause, severity, and disease course. Figure 8. shows the percent of respondents that correctly answered four malaria-related knowledge questions:

1. Participants were asked what they believed were the symptoms of malaria. The first cluster of bars on the left of Figure 7 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 cluster of bars 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 cluster of bars 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 (testing knowledge of subclinical/low-density malaria infection). The fourth cluster of bars on the right shows the percent of respondents that did believe that it is possible to be infected with malaria without having symptoms.

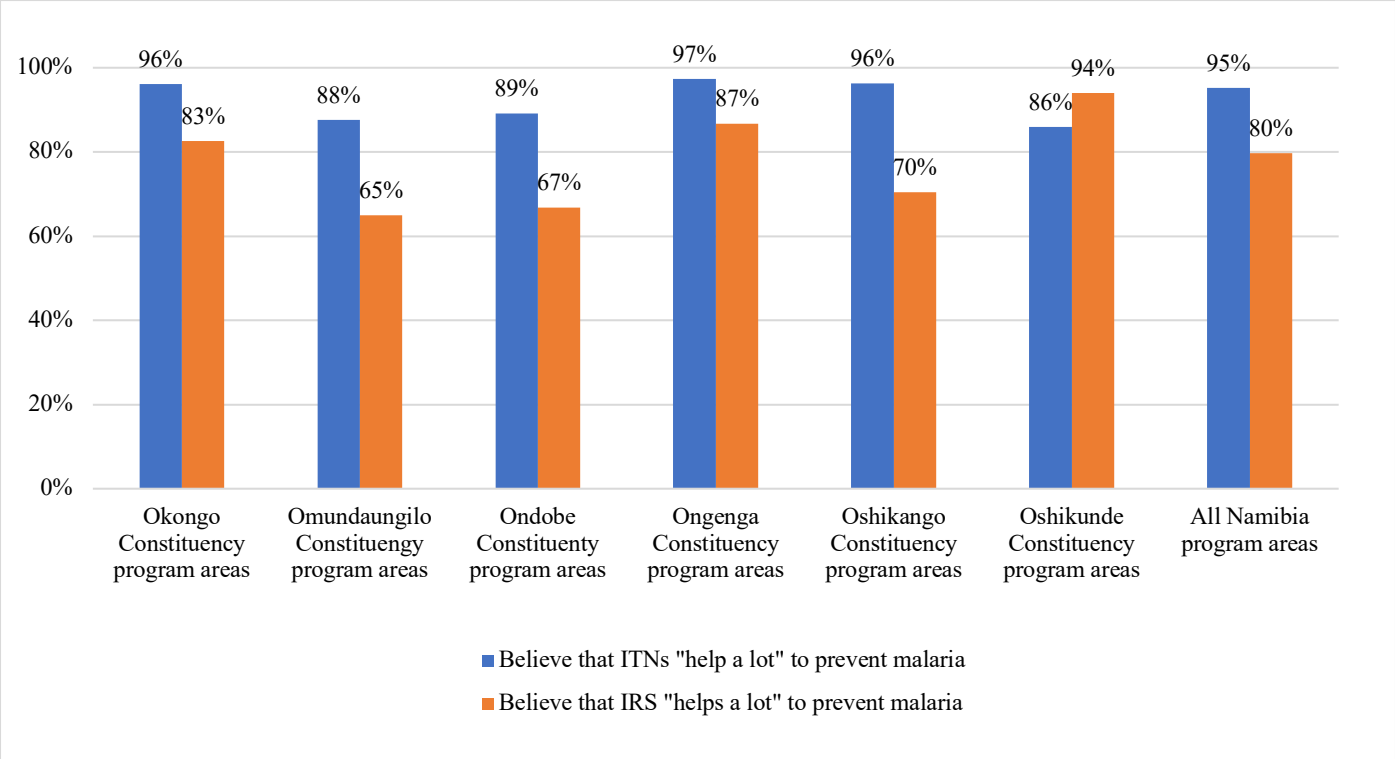
Knowledge of the mosquito as the cause of malaria transmission and knowledge that malaria could be deadly if left untreated were high across all program areas (96% and 98%, respectively). Knowledge of "fever" or "chills" as a symptom of malaria was also relatively high (84%), but some room for improvement (though, there could be some issue with translation of "fever", despite the survey being administered in Oshiwambo). The lowest knowledge level was the belief that it is possible to be infected with malaria without having symptoms (78%). 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.

Figure 8. Percent of respondents that correctly answered malaria-related knowledge questions, among all program areas (2024)



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 9. Most participants believed that ITNs "help a lot" to prevent malaria (95%). Fewer, but still the majority believed that IRS "helps a lot" to prevent malaria (80%), though there is room for improvement in positive attitudes toward IRS in order to maximize acceptance, and therefore efficacy, of future IRS campaigns.

Figure 9. Percent of respondents that believed ITNs and IRS "help a lot" to prevent malaria (2024)



Appendix 1. 2024 KAP Survey sampling frame (Isdell:Flowers / TKMI program areas)

Region	Constituency	Village
Ohangwena	Ongenga	Onangama A
		Onangama B
		Eenghoshi A
		Eenghoshi C
		Oshindobe Hakandonga
		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	Onanghwe
		Okadiva 2
		Okadiva 1
		Oyongo
		Odibo
		Oshikango
		Onamhinda
		Okatale
	Okongo	Oshalande
		Oshalunghima
		Ekoka
		Ohenghombo
		Oshalumbu
		Onhuli
		Ehafo
		Olukula
		Ongalangobe
		Okongo
		Ohameva
		Omuwike
		Okalunga/Onamata
		Oluhapa
		Omulamba A
		Ombuudiya
		Oshuudiya (Shapopi)
		Onheleiwa

Region	Constituency	Village
		Omauni # 1 & 2
		Onhehanga
		Omushiyo
		Enyana
		Omboloka
		Oshamukweni
		Oshamambo
		Kumininenge
		Onghwiyu #1
		Odevadema
		Oshushu
		Oidiva
		Onhumba
		Oshinanyiki
		Oshishogolo
		Oshitishiwa
		Olutwatwa
		Omupembe
		Ekangolomuve
		Oshikoxa
		Omanha #1
		Omanha #2
	Oshikunde	Onamafila
		Oshifitu
		Oshambada
		Emanya
		Ondobe Yelao
		Oshitayi
		Oshilambwili
		Ombuumbu
		Embwanyana
		Oluwaya
		Oupili
		Oshuuli
		Omufiya
		Omukukutu Wambekele
		Okamukukutu (Omukukutu waHamundjungu)
	Ondobe	Onamunama
		Okanhundi Kamokaxwa
		Okanghudi Kapohamba
		Etomba East (Haifesho)
		Okauva
		Omutaku
		Omakelo
		Omungholyo
		Ondwi
		Oheti A (Salom)
		Oheti B (Mutumbulwa)
		Oshandi A (Mhalangu)
		Oshandi B (Hashoongo)
	Omundaungilo	Omundaungilo
		Omhalapapa
		Oshipala
		Onhunda
		Ohauwanga
		Omutwewondjaba
		Okahauwangwena
		Omadano
		Onamungondji
		Onaimbungu
		Epinga
		Ohehonge
		Omufituwekuta
		Oshikonda
		Ombaaloka
		Onehova
		Onaupanya
		Embidi
		Eexwa

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.