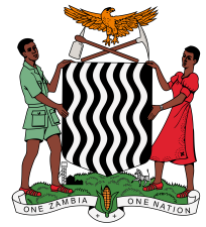


J.C. FLOWERS  
FOUNDATION



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

**Results from KAP Survey within the program areas of the Anglican Diocese of Lusaka's Isdell:Flowers Cross Border Malaria Initiative  
Data collected between April – June 2023**

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## **Abbreviations**

CHW	community health worker
HFCA	health facility catchment area
IFCBMI	Isdell:Flowers Cross Border Malaria Initiative
IPTp	intermittent preventive treatment of malaria in pregnancy
IRS	indoor residual spraying
ITN	insecticide treated net
KAP	knowledge, attitudes, and practices
MCA	malaria control agent
MOH	Ministry of Health
NHC	neighborhood health committee
NHRA	National Health Research Authority
NMEC	National Malaria Elimination Centre
UNZABREC	University of Zambia Biomedical Research Ethics Committee

## **Section 1. Executive Summary**

Through the Isdell:Flowers Cross Border Malaria Initiative (IFCBMI), the Anglican Diocese of Lusaka facilitates community engagement for malaria elimination in select communities in Southern and Western Provinces, in partnership with the Ministry of Health (MOH) of Zambia and the J.C. Flowers Foundation. IFCBMI conducted this study to understand malaria-related knowledge, attitudes, and practices (“KAP”) of program areas through a yearly 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: use of and access to insecticide treated nets (ITNs); indoor residual spraying (IRS) coverage within 12 months prior to the survey; uptake of 3+ doses of intermittent preventive treatment of malaria in pregnancy (IPTp) among women who gave birth in the previous 12 months; 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, IRS, and IPTp. 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 IFCBMI program areas and cannot be directly extrapolated to the District, Provincial, or National level. A full listing of IFCBMI Zambia program areas included in the sampling frame can be found in Appendix 1. Below is a summary of the key 2023 KAP Survey Results:

### **Insecticide treated nets (ITNs)**

*Most households owned at least one net, but very few households owned enough ITNs to cover everyone in the household.*

Across all program areas, 82% of households owned at least one ITN, but only 61% owned at least one ITN in good condition. Even fewer households (26%) owned at least one ITN for every two people who slept in the household the previous night, and only 12% of households owned at least one ITN in good condition for every two people who slept in the household the previous night.

*In general, people used ITNs if they had access to them, but access to ITNs was low.*

Among all surveyed households, 64% of people slept under an ITN the previous night. However, among only households that owned at least one ITN for every two people, 92% of people slept under an ITN the previous night, and 94% did so among only households that owned at least one good condition ITN for every two people. This suggests that access to good condition ITNs is a main driver of their use.

*In general, pregnant women and children <5 years of age used an ITN the previous night at higher levels than the general population, suggesting that these higher-risk groups are being prioritized for ITN use. However, this varies widely among program areas by District.*

Among all surveyed households in Zambia, 80% of pregnant women and 80% of children <5 slept under an ITN the previous night (compared to 64% of the general population). However, there was much variation among program areas at the District level: ITN use by pregnant women ranged from 31%-96% and ITN use by children <5 ranged from 54%-93%.

### **Indoor residual spraying (IRS)**

*Past 12-month household IRS coverage varies widely by District-level program areas; some areas achieved the WHO recommended level of  $\geq 85\%$  household IRS coverage, but most areas fell short of this important benchmark.*

Past-12 month household IRS coverage reached the WHO-recommended level of  $\geq 85\%$  among program areas within Mongu, Senanga, and Shangombo Districts, while program areas within Sesheke, Livingstone, Mulobezi, and Sikongo Districts did not meet this important benchmark and had relatively lower household IRS coverage.

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

*Many children <5 with fever in the two weeks prior to the survey did not seek care from a health facility or CHW within 24 hours of the start of the fever. However, most children with fevers who did seek care from a health facility or CHW received a malaria test. There are still some children who tested positive for malaria but did not receive malaria treatment.*

Across all Zambia program areas, 76% 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, 95% received a blood test for malaria. Among children who tested positive for malaria, 79% received Coartem for malaria treatment.

### **Intermittent preventive treatment of malaria in pregnancy (IPTp)**

*Many respondents took three or more (3+) doses of IPTp during their pregnancy, though this result ranges widely at the District level.*

Across all Zambia program areas in 2022, 82% of respondents who gave birth in the previous 12 months reported taking 3+ doses of IPTp during their pregnancy (at the level of program areas by District, reported IPTp 3+ uptake ranged from 53%-100%).

### **Knowledge and attitudes**

*Malaria knowledge was high, and the majority of respondents believed that key malaria elimination activities (ITNs, IRS, and IPTp) do help to prevent malaria.*

Across all Zambia program areas, 97% of respondents correctly identified “fever” or “feeling cold/chills” as a symptom of malaria, while 91% correctly identified the mosquito as the cause of malaria transmission (and listed nothing else incorrect). Almost all respondents believed that ITNs and IPTp help “a lot” to prevent malaria (97% and 96%, respectively), while 83% felt that IRS helps “a lot” to prevent malaria.

## **Section 2. Background**

Through the Isdell:Flowers Cross Border Malaria Initiative (IFCBMI), the Anglican Diocese of Lusaka facilitates community engagement for malaria elimination in select communities in Southern and Western Provinces, in partnership with the Ministry of Health (MOH) of Zambia's National Malaria Elimination Centre (NMEC) 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.

The Anglican Diocese of Lusaka supports a network of approximately 400 Community Health Workers (CHWs) and malaria control agents (MCAs) who conduct community-based testing and treatment for malaria, where policy allows, and deliver malaria education and prevention services within their communities. Each MCA and CHW supports between 45-200 households, depending on their location. Religious leaders, teachers, and other influential community members support the efforts of this cadre and help to deliver malaria education within churches, schools, and the community as a whole.

IFCBMI received approval from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) and the National Health Research Authority (NHRA) of Zambia to conduct a study to gain a better understanding of malaria-related knowledge, attitudes, and practices ("KAP") among community members living within IFCBMI Zambia 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, IRS, and IPTp
- 3) Practices: measure the reported use of and access to insecticide treated nets (ITNs); reported household indoor residual spraying (IRS) coverage within the previous 12 months; reported uptake of intermittent treatment of malaria in pregnancy (IPTp) among women who gave birth in the 12 months; and the reported trajectory of care for children under five years with fever in the previous two weeks

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, Namibia, and Zimbabwe. Study findings will also be shared with the National Malaria Elimination Centre of the Ministry of Health of Zambia and the academic community to contribute to the body of knowledge on malaria in these communities in Zambia.

This document presents key results from the 2023 KAP Survey, with select results from the 2020-2022 KAP Surveys for comparison over time. Results are representative of IFCBMI program areas and cannot be directly extrapolated to the District, Provincial, or National level. A full listing of the IFCBMI Zambia 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, including all KAP Survey indicator results at the level of the Health Facility Catchment Area.

### Section 3. Methodology

#### Sampling frame and sample size

The sampling frame for the 2023 KAP Survey was all IFCBMI program areas in Zambia (Appendix 1). The 2023 sample size was determined to be a minimum of 2500 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, the proportion of women who gave birth in the previous 12 months that took 3+ doses of IPTp during their pregnancy, 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 2020-2023 KAP Surveys and Table 2 shows dates of data collection.

**Table 1. Zambia KAP Survey sample sizes (2020-2023 KAP Surveys)**

Province	Program areas within Districts	2020	2021	2022	2023
Southern	Kazungula	322	314	302	387
	Livingstone	673	559	446	543
Western	Kalabo	175	251	169	214
	Mongu	127	115	85	113
	Mulobezi	183	150	107	159
	Senanga	103	120	68	91
	Sesheke	541	404	336	424
	Shangombo	353	392	279	355
	Sikongo	248	236	190	267
<b>TOTAL</b>		<b>2725</b>	<b>2541</b>	<b>1982</b>	<b>2553</b>
<b>Response rate</b>		<b>97.5%</b>	<b>97.1%</b>	<b>95.8%</b>	<b>96.0%</b>

**Table 2. Dates of KAP Survey data collection (2020-2023 KAP Surveys)**

Year	Dates of data collection
2020	6 July – 22 August
2021	10 May – 16 June
2022	12 April – 23 May
2023	12 April – 29 June

#### 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. They also are most likely to answer questions about their own IPTp history 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 2022 and 2023 survey years, between 2021 and 2022 survey years, and between 2020 and 2021 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 IFCBMI program areas only and cannot be directly extrapolated to the District, Provincial, or National level. Some graphs show results from prior KAP Survey years (2020-2022) compared to 2023 KAP Survey results, while other graphs only showcase 2023 KAP Survey results. In graphical depictions of results, statistically significant results of a given year compared to the prior survey year are denoted by bold typeface. In tables, statistically significant results are denoted by green shading (indicating a statistically significant increase compared to the previous survey year) or red shading (indicating a statistically significant decrease compared to the previous survey year).

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

<b>Background characteristic</b>	
Average age of respondent (n)	33.7
Households with at least one child under 5 who slept there the previous night (%)	68%
Average number of children <5 in household the previous night, among households with at least one child <5 (n)	1.4
Households with at least one pregnant woman who slept there the previous night (%)	30%
Average number of people who slept in the household the prior night (n)	5.2
Average number of sleeping spaces (n)	2.7
Households with surrounding standing water, per visual observation of data collector (%)	11%

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

<b>Education level</b>	<b>%</b>
Never attended school	11%
Attended some primary school	19%
Completed primary school	18%
Attended some secondary school	26%
Completed secondary school	18%
Higher than secondary school	7%
Not sure	0%

Insecticide treated nets (ITNs)

All participants were asked about their household ITN ownership and household member use of ITNs the previous night. Figure 1. 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 2020-2023. Bolded results indicate a statistically significant change (p-value of <0.05) from the previous year.

Across all Zambia program areas, household ownership of ITNs, access to ITNs, and use of ITNs follow the same pattern from 2020-2023: there were significant increases (p<0.05) in all of these indicators from 2020-2021, followed by significant decreases in these indicators from 2021-2022. Between 2022-2023, there were again significant decreases in all indicators, except for ITN use which showed a non-significant decrease.

As of 2023, many households within program areas owned at least one ITN (82%), yet very few households owned at least one ITN for every two people who slept in the household last night (26%). 60% of people had access to an ITN in their own household (assuming each ITN covers two people) and 64% of people slept under an ITN the night before the survey, which suggests that those who have access to ITNs are using them.

**Figure 1. ITN access, use, and ownership (%), all Zambia program areas (2020-2023 KAP Surveys)**

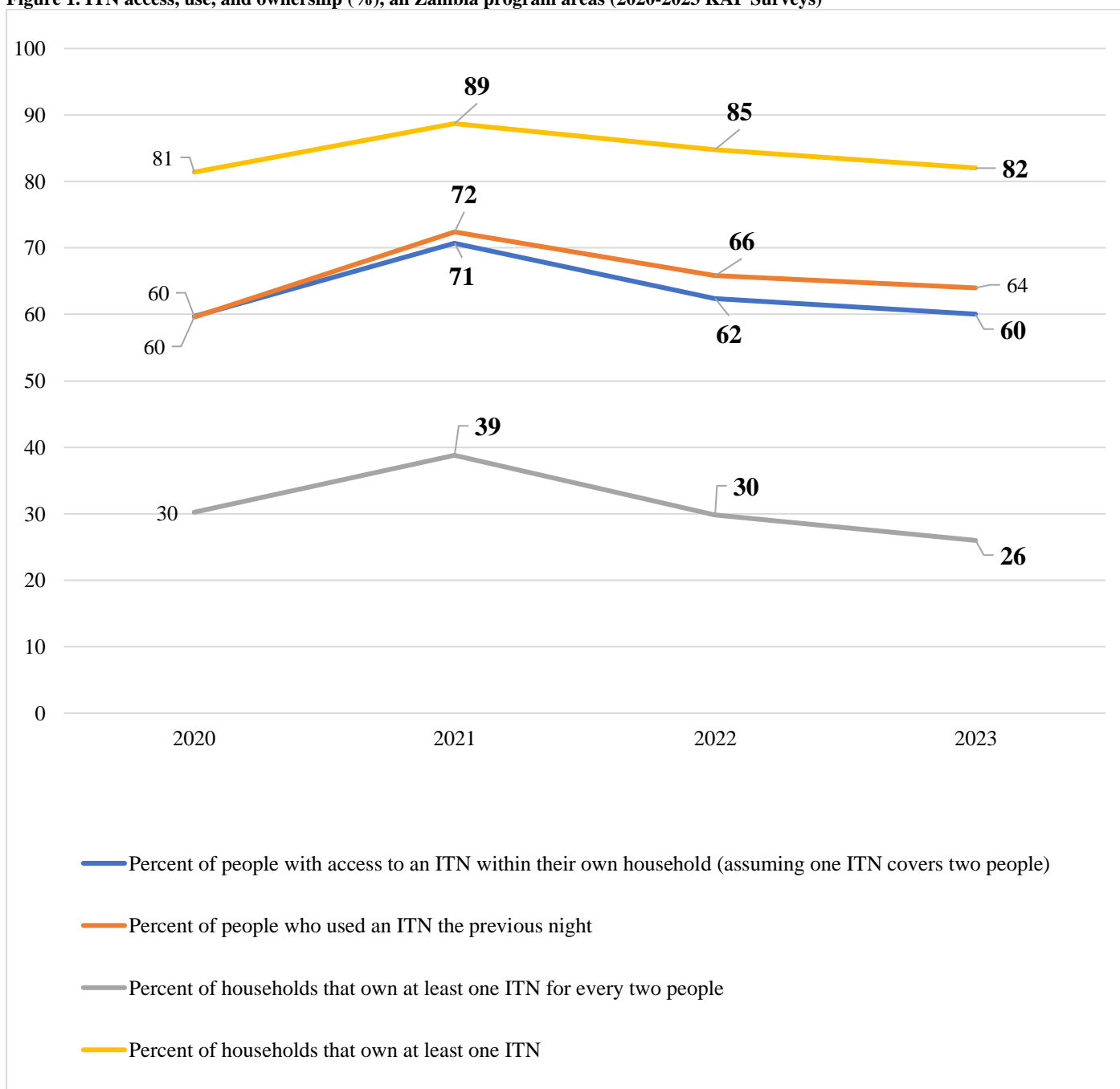




Figure 2. shows varying levels of household ITN ownership (2023 KAP Survey). Though there is some variation between District program areas, most District program areas follow the same pattern of ITN ownership: the majority of households owned at least one ITN, but much fewer households owned at least one ITN in good condition (defined as not having any holes larger than a thumb), and very few households owned at least one ITN for every two people in the household. Only a small amount of households own at least one ITN in good condition for every two people in the household.

**Figure 2. Household ownership of ITNs (%) (2023 KAP Survey)**

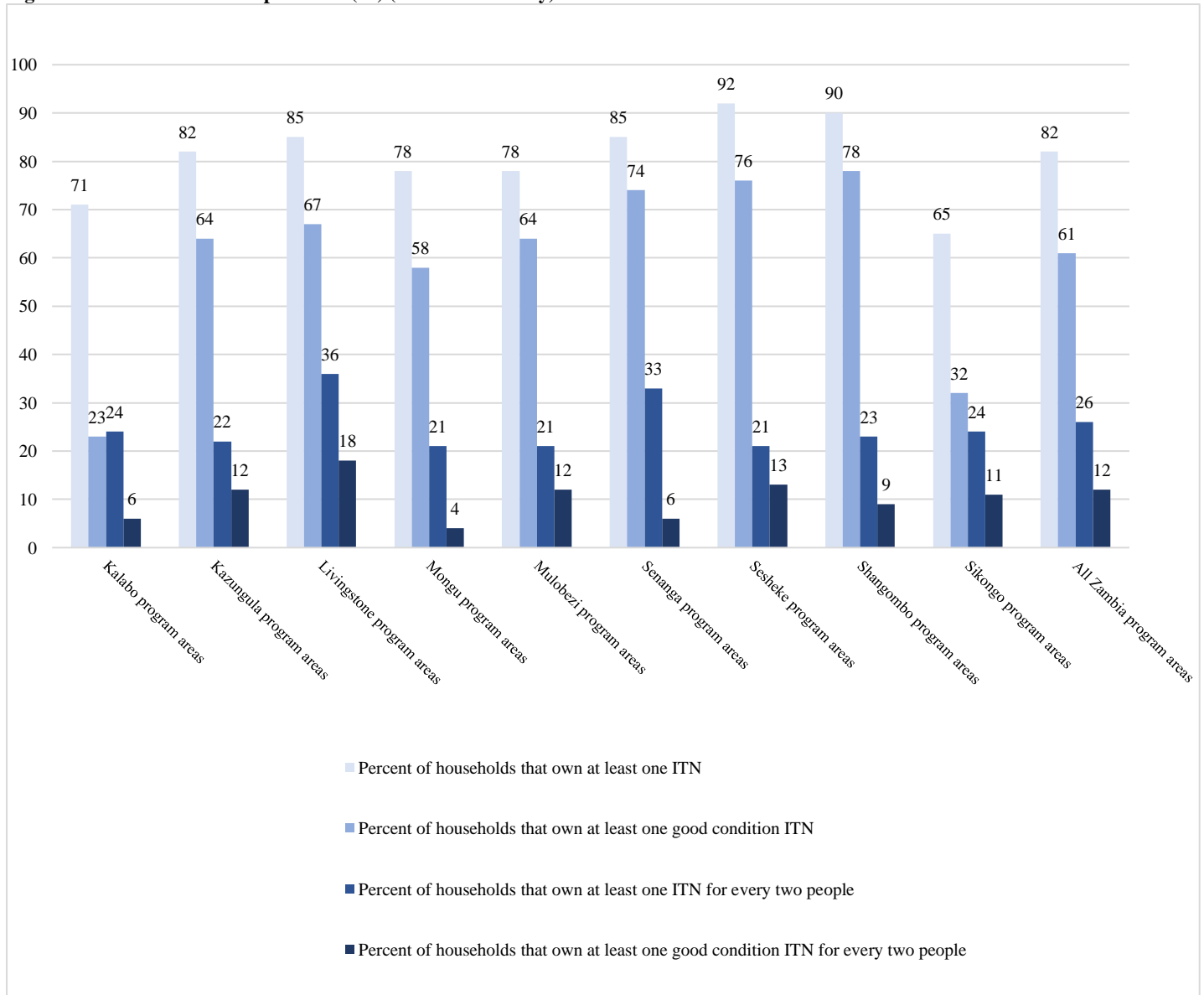


Figure 3. shows ITN use, defined as the percent of people who slept under an ITN the previous night, among the general population (all household members), among pregnant women, and among children <5 (2023 KAP Survey). Use of ITNs among pregnant women and children <5 was highest in Shangombo District program areas (96% of pregnant women used an ITN the previous night) and Sesheke District program areas (93% of children <5 used an ITN the previous night) and lowest in Sikongo program areas (31% and 54%, respectively). In every District level program area except for Sikongo, ITN use by pregnant women and children <5 was higher than ITN use by the general population, indicating that, in general, these groups are correctly being prioritized for ITN use when there are not enough ITNs in the household to cover everyone.

**Figure 3. 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)**

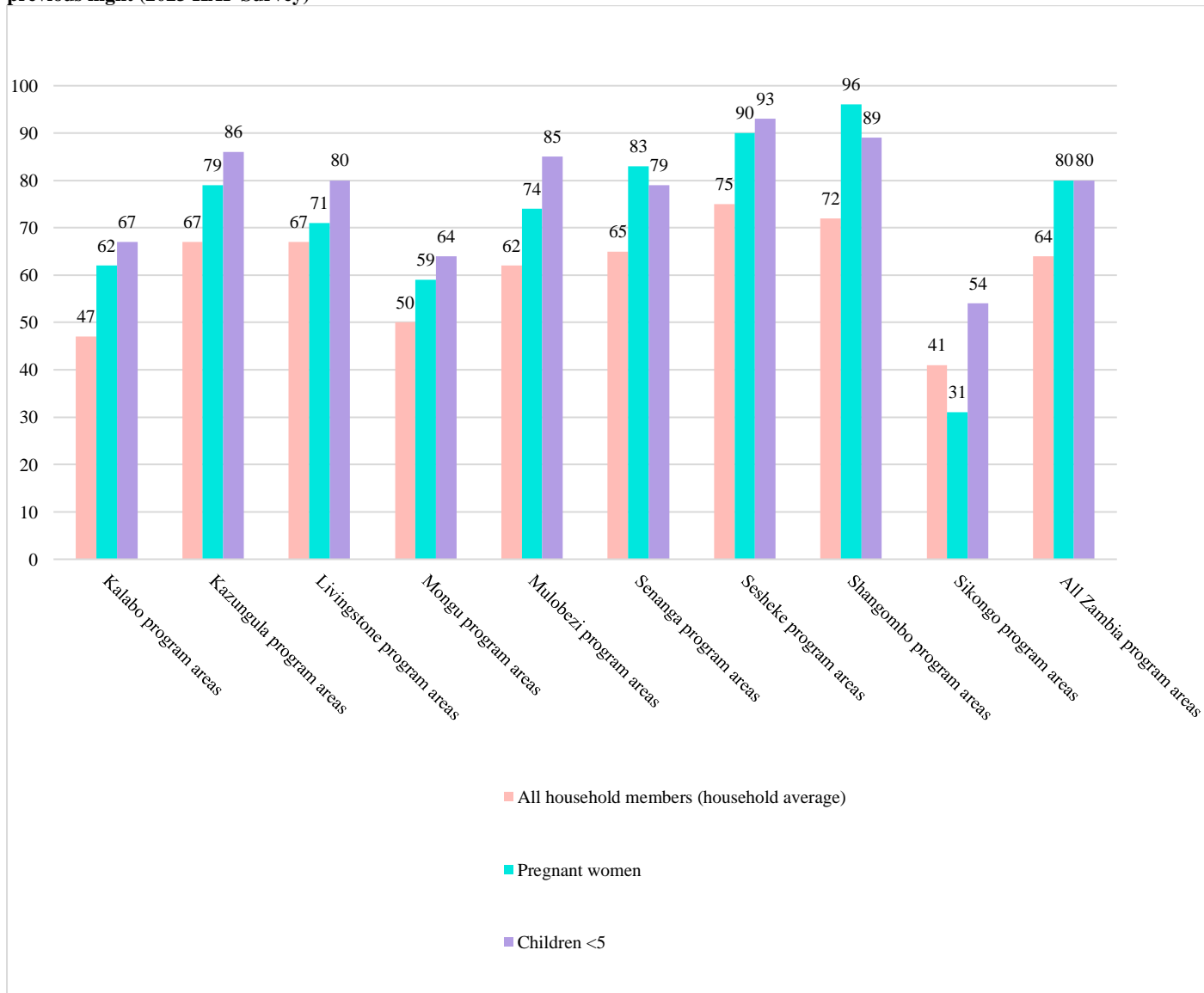
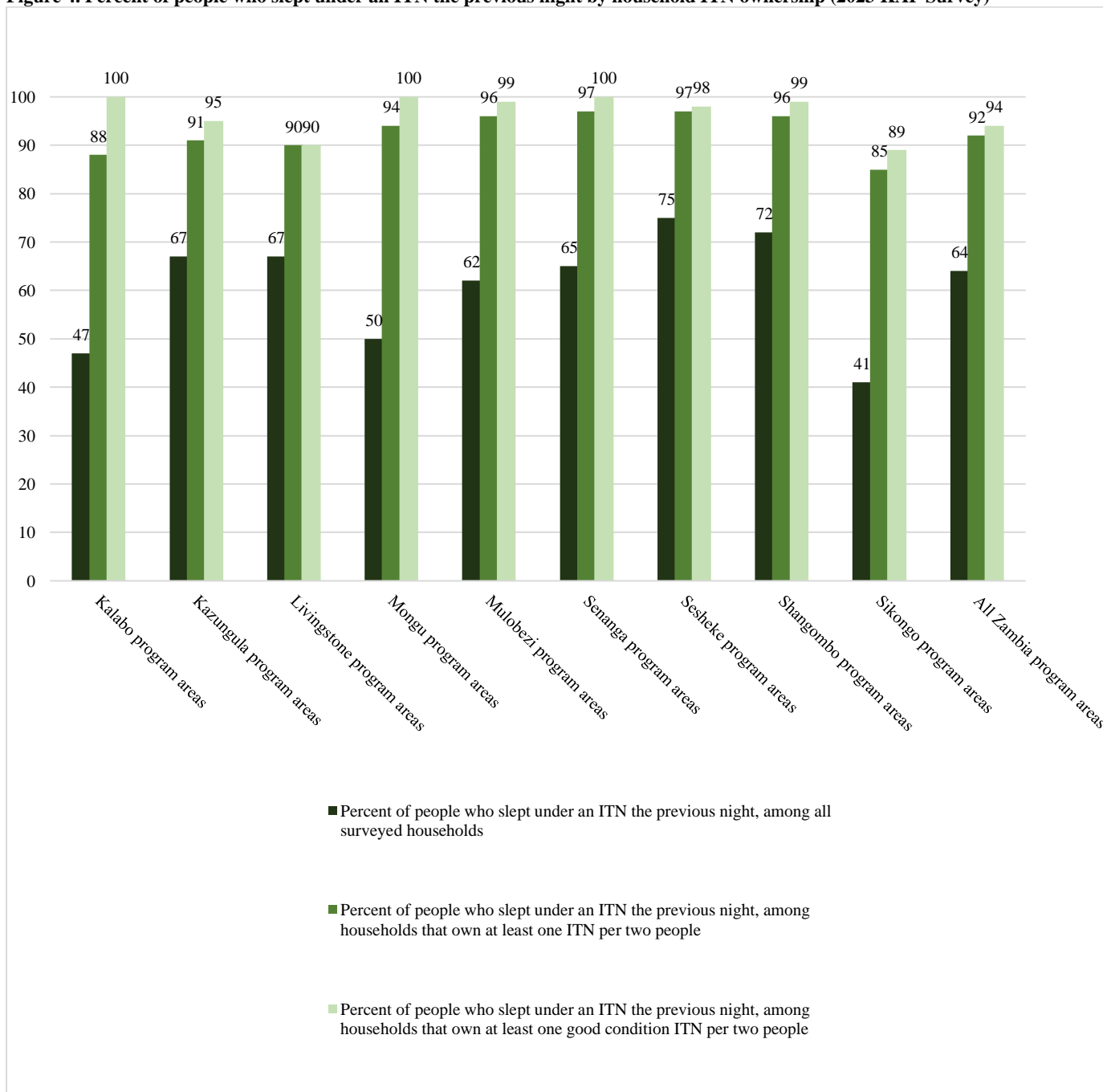


Figure 4 shows ITN use among households with varying levels of household ITN ownership (2023 KAP Survey). Among all surveyed households, ITN use is relatively low (ranging from 41% to 75% among program areas by District). However, among only households that owned enough ITNs to cover everyone, ITN use is higher (ranging from 85% to 97%), and even higher among households that owned enough ITNs in good condition to cover everyone (ranging from 89% to 100%). This suggests that people will use ITNs if they have access to ITNs, especially access to ITNs in good condition, and that the low overall ITN use is likely largely attributed to lack of access to ITNs and not due to poor ITN use behaviour.

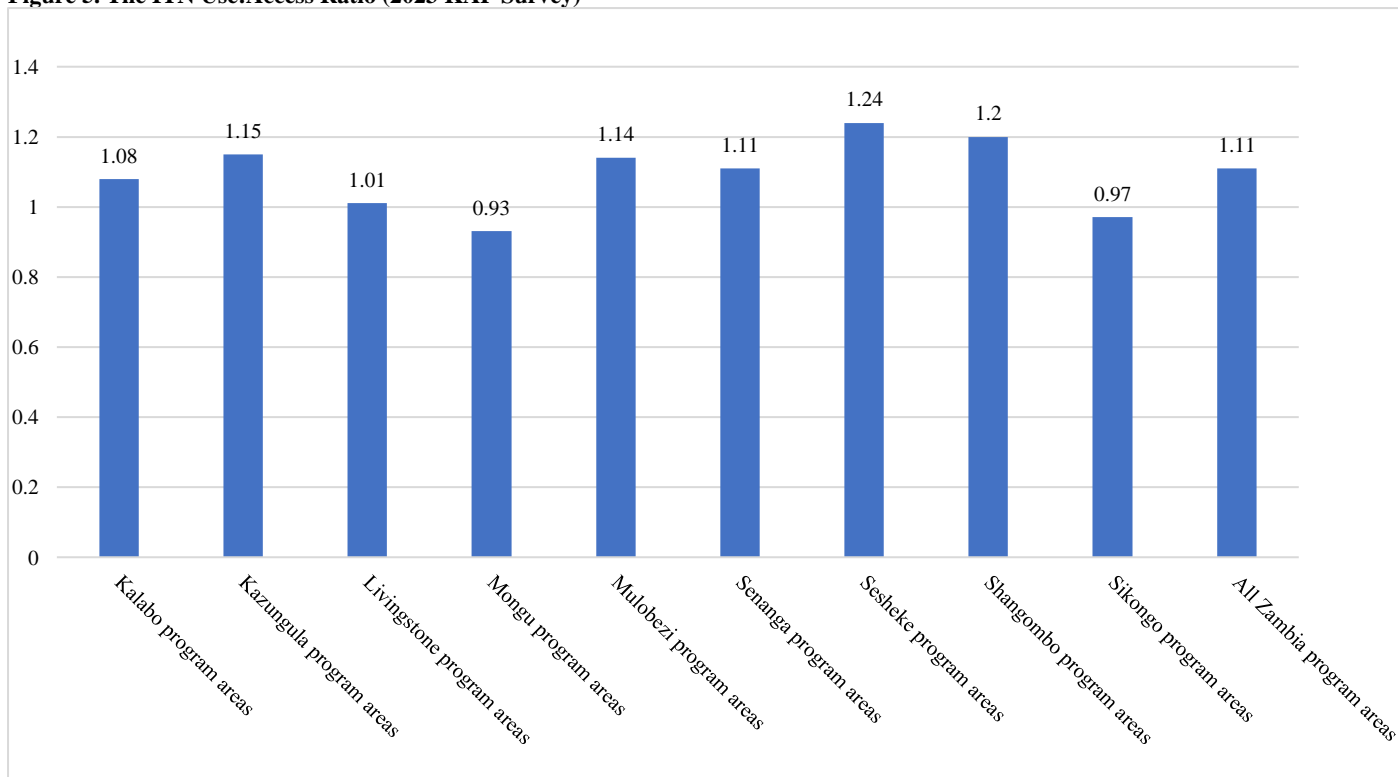
**Figure 4. Percent of people who slept under an ITN the previous night by household ITN ownership (2023 KAP Survey)**



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 5 shows the ITN Use:Access Ratio from the 2023 KAP Survey. Across all Zambia program areas, the ITN Use:Access Ratio was 1.11, indicating that all available ITN spaces were being used and, in many cases, more than two people were sleeping under an ITN. This suggests that desired ITN use behavior is high and most people will use ITNs if they have them, suggesting that the main driver of low overall ITN use is lack of access to ITNs.

**Figure 5. The ITN Use:Access Ratio (2023 KAP Survey)**

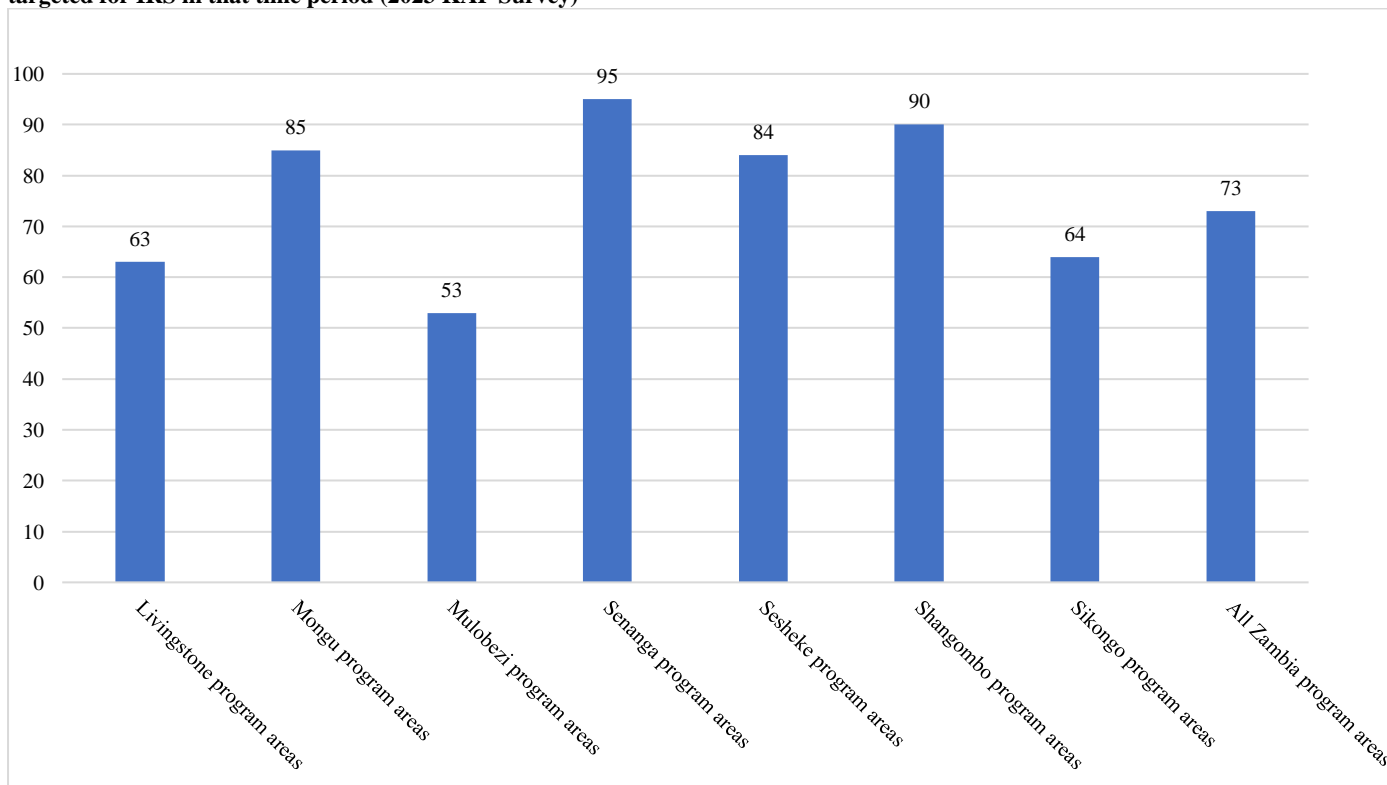


Indoor residual spraying (IRS)

Figure 6 shows the proportions of households that reported receiving IRS within 12 months prior to the 2023 KAP Survey, among only those households located in areas that were targeted to receive IRS in that time period. A listing of program areas that were targeted to receive IRS within 12 months prior to the 2023 KAP Survey, and thus those areas that were included in denominator of the calculation of this indicator, is located in Appendix 1. Kalabo and Kazungula program areas are not shown because there were no program areas within these Districts that were targeted for 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 reached the WHO-recommended level of  $\geq 85\%$  among program areas in Mongu (85%), Senanga (95%), and Shangombo (90%) program areas, with Sesheke program areas just below (84%). Program areas in Livingstone, Mulobezi, and Sikongo Districts did not meet this important benchmark and had relatively lower household IRS coverage.

**Figure 6. Percent of households that received IRS within 12 months prior to the survey, among households located in areas that were targeted for IRS in that time period (2023 KAP Survey)**



Respondents who reported that their household did not receive IRS within 12 months prior to the 2023 KAP Survey were asked why they did not receive it, the responses to which are shown in Table 5. In Livingstone, Mulobezi, and Sikongo program areas, the most common reason for not receiving IRS was “no one came to my household to conduct IRS.” In Mongu, Senanga, Sesheke, and Shangombo program areas, the most common reason for not receiving IRS was “no one was at my household when the spray team came to offer IRS.” The number of households that reportedly did not receive IRS because they refused it were highest in Livingstone program areas (13) Shangombo program areas (11).

**Table 5. Reasons why households did not receive IRS in the previous 12 months (number), among households that reportedly did not receive IRS but were located in areas that were targeted to receive IRS within the 12 months prior to the survey (2023 KAP Survey)**

	Total number of households that did not receive IRS	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
Program areas within Districts	n	n	n	n	n	n
Livingstone	202	128	53	13	3	4
Mongu	18	3	8	2	5	0
Mulobezi	81	66	1	2	3	8
Senanga	5	1	3	1	0	0
Sesheke	53	18	26	4	1	4
Shangombo	33	8	14	11	0	0
Sikongo	97	49	33	2	6	7

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 and/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 7) helps to visualize the gaps within the care-seeking trajectory of children <5 with fever (2023 KAP Survey).

If respondents indicated that they were a mother or caregiver of a child <5, they were asked if their child had a fever within the previous two weeks and, if yes, about their child’s trajectory of care for that fever. The largest gap in the trajectory of care was seeking care within 24 hours of the start of the fever. Among respondents whose child <5 had a fever in the previous two weeks, 505/669 (76%) sought care from a health facility or CHW within 24 hours of the fever onset. The second largest gap in the trajectory of care was receiving malaria treatment if tested positive for malaria. Among respondents whose child <5 with fever tested positive for malaria, 266/331 (80%) received malaria treatment.

**Figure 7. Trajectory of care cascade (number) for children <5 with fever within the two weeks prior to the survey, all Zambia program areas (2023 KAP Survey)**

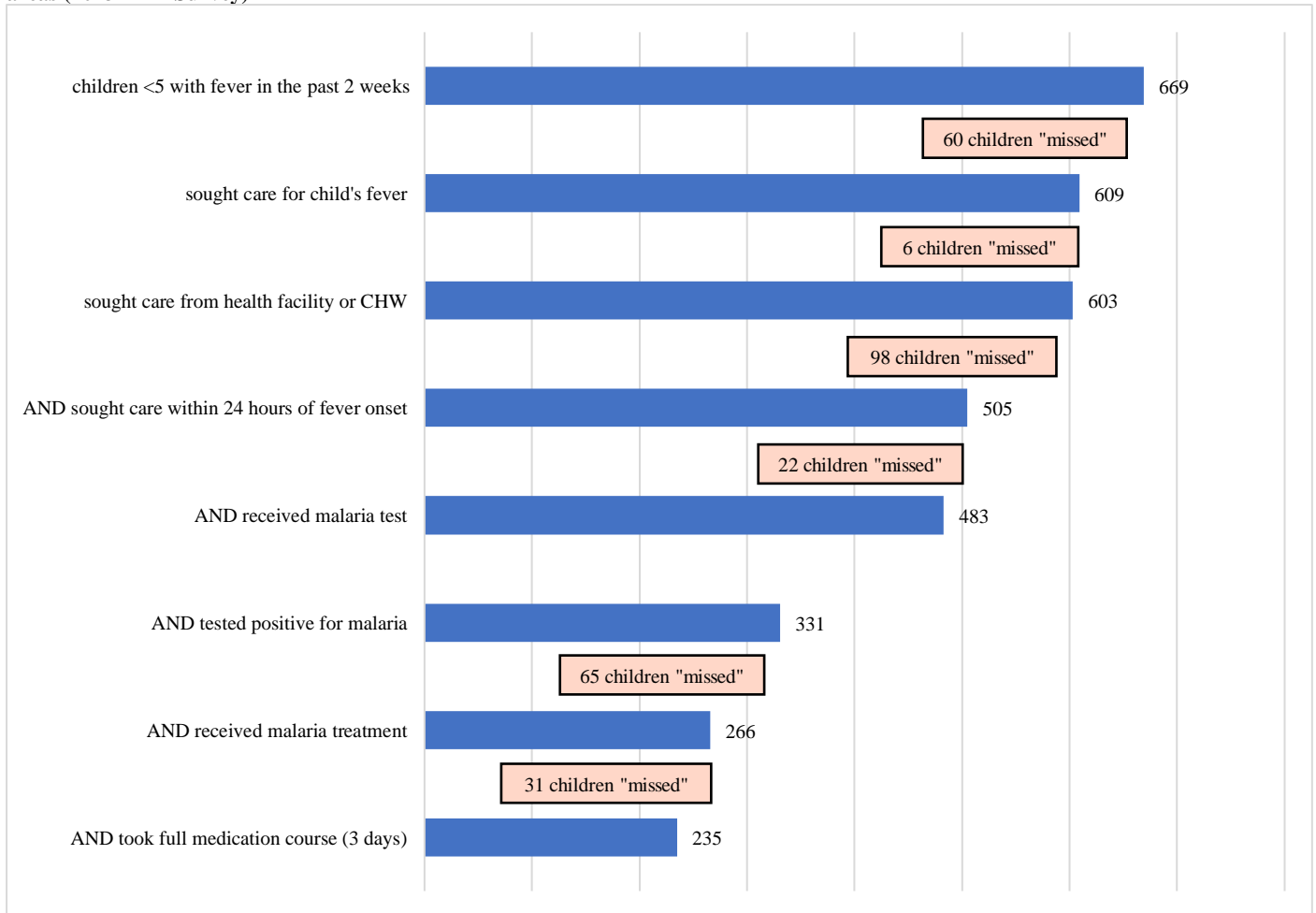


Table 6. shows the three key indicators of the trajectory of care for children <5 with fever across all Zambia program areas: 1) the proportion of children <5 with fever who sought care within 24 hours of fever onset; 2) the proportion who received a malaria test (among those who sought care from a health facility or CHW); and 3) the proportion who received malaria treatment (among those who tested positive). Green shading indicates a statistically significant change from the previous year. Across all Zambia program areas, the proportion of children <5 with fever in the two weeks prior to the survey who sought care from a health facility of CHW within 24 hours of the start of the fever increased significantly between 2022-2023 ( $p<0.001$ ). The proportion of children <5 with fever in the past two weeks received a malaria test, among those sought care from a health facility or CHW, also increased significantly between 2022-2023 ( $p<0.001$ ). However, the proportion of children who received Coartem for treatment of malaria, among those who reportedly tested positive for malaria, decreased significantly from 2022-2023 ( $p<0.001$ ).

**Table 6. Key indicators in the trajectory of care for children <5 with fever in the prior two weeks (%), all Zambia program areas (2021-2023 KAP Surveys)**

	2021	2022	2023
Sought care from a health facility or CHW within 24 hours of fever onset, among all children <5 with fever in the prior two weeks	66%	65%	76%↑
Received a malaria test, among children <5 with fever who sought care from a health facility or CHW	86%	88%	95%↑
Received malaria treatment, among those children <5 with fever who tested positive for malaria	88%	95%↑	79%↓

Table 7. shows the same three indicators as Figure 7, but among program areas at the District level for the 2023 Survey year only. Results shaded in green denote a significant increase from the 2022 KAP Survey results while results shaded in red denote a significant decrease. The proportion of children <5 with fever who received malaria treatment after testing positive for malaria was remarkably lower in Sikongo District program areas than in the other program areas with only 45% of children who tested positive reportedly receiving treatment for malaria.

**Table 7. Children <5 with fever who sought care from a health facility or CHW within 24 hours of the start of the fever (2023 KAP Survey)**

Program areas within Districts	Sought care from a health facility or CHW within 24 hours of fever onset, among all children <5 with fever in the prior two weeks	Received a malaria test, among children <5 with fever who sought care from a health facility or CHW	Received malaria treatment, among those children <5 with fever who tested positive for malaria
Kalabo	92% (101/111) ↑	97% (104/107) ↑	94% (89/95)
Kazungula	53% (30/56)	97% (40/41) ↑	93% (16/17)
Livingstone	63% (50/79)	94% (59/63)	96% (22/23)
Mongu	74% (40/55)	88% (46/52)	83% (21/25)
Mulobezi	62% (17/27)	88% (21/24)	100% (9/9)
Senanga	98% (49/50)	100% (50/50)	98% (39/40)
Sesheke	82% (64/78)	89% (62/70)	95% (24/25)
Shangombo	68% (49/72)	92% (58/63)	100% (28/28)
Sikongo	74% (105/141) ↑	98% (130/133)	45% (52/118) ↓
All Zambia program areas	76% (505/669) ↑	95% (570/603) ↑	79% (300/380) ↓

### Intermittent preventive treatment of malaria in pregnancy (IPTp)

Table 8. shows the proportion of women that reported taking three or more (3+) doses of IPTp during their pregnancy, among those who gave birth within 12 months prior to the 2023 KAP Survey. Results shaded in red denote a significant decrease from the 2022 KAP Survey results. Program areas within Mongu and Sikongo Districts had relatively lower IPTp 3+ uptake (53% and 54%, respectively) compared to the other program areas which ranged from 82%-100%.

**Table 8. Women who took 3+ doses of IPTp during their pregnancy, among those who gave birth in the 12 months prior to the survey (2023 KAP Survey)**

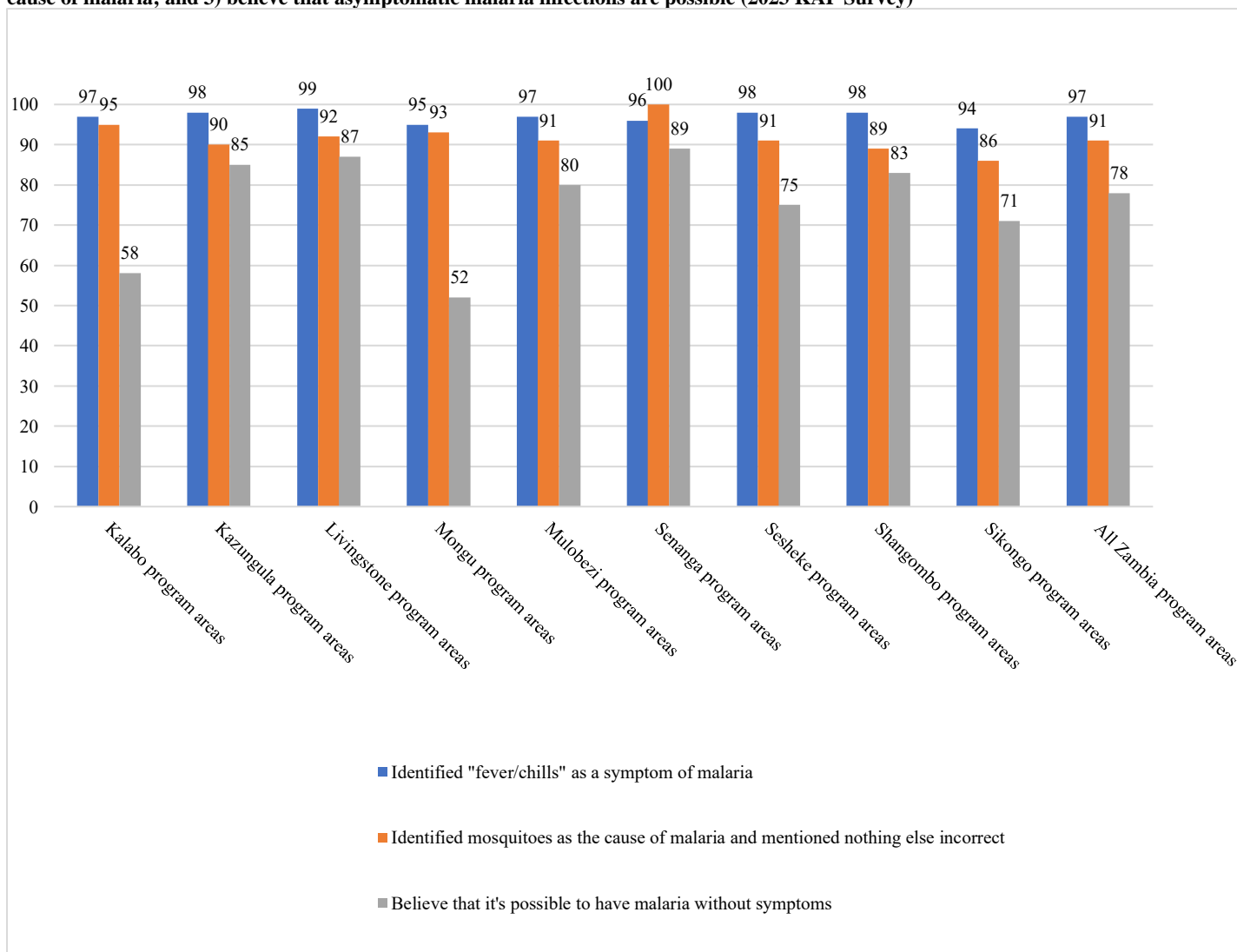
Program areas within Districts	Took 3+ doses of IPTp during pregnancy, among respondents who gave birth in the 12 months prior to the survey
Kalabo	87% (28/32)
Kazungula	89% (78/88)
Livingstone	88% (93/105) ↓
Mongu	53% (19/38) ↓
Mulobezi	85% (42/48)
Senanga	100% (20/20)
Sesheke	84% (92/108)
Shangombo	88% (96/109)
Sikongo	54% (38/70)
All Zambia program areas	82% (506/618) ↓



## Knowledge and attitudes

Respondents were asked questions pertaining to their knowledge of malaria symptoms and cause. Figure 8. displays three key knowledge indicators (2023 KAP Survey): 1) the proportion of respondents who identified “fever/chills” as a symptom of malaria; 2) the proportion of respondents who identified the mosquito as the cause of malaria, and mentioned nothing else incorrect (such as eating unripe fruit or getting soaked in the rain); and 3) the proportion of respondents who believed it is possible to have malaria without symptoms. In general, most respondents correctly identified “fever/chills” as a symptom of malaria (97%) and correctly identified the mosquito as the cause of malaria transmission (91%). Fewer respondents believed it’s possible to have malaria without symptoms (78%), lowest levels in Kalabo and Mongu program areas.

**Figure 8. Percent of respondents who: 1) correctly identified “fever/chills” as a symptom of malaria; 2) identified mosquitoes as the cause of malaria; and 3) believe that asymptomatic malaria infections are possible (2023 KAP Survey)**



Respondents were asked whether they believed that ITNs, IRS, and IPTp “helps a lot,” “helps a little,” or “does not help” to prevent malaria. Table 9. shows these results from 2020-2023 KAP Surveys; results in green denote a significant increase from the prior year and results in red denote a significant decrease from the prior year. The proportion of respondents who believed that these interventions “help a lot” to prevent malaria have increased each year from 2020-2022. In 2023, the proportion who believed that IRS “helps a lot” to prevent malaria decreased significantly ( $p=0.034$ ).

**Table 9. Percent of respondents that believe that ITNs, IRS, and IPTp “help a lot” to prevent malaria, all Zambia program areas (2020-2023 KAP Surveys)**

Indicator	2020	2021	2022	2023
Think that ITNs “help a lot” to prevent malaria	94%	97% ↑	98% ↑	97%
Think that IRS “helps a lot” to prevent malaria	70%	76% ↑	86% ↑	83% ↓
Think that IPTp “helps a lot” to prevent consequences of malaria in pregnancy	93%	93%	97% ↑	96%

**Appendix 1. 2023 KAP Survey sampling frame (IFCBMI Zambia program areas) and areas targeted for IRS within 12 months prior to the 2023 KAP Survey**

Province	District	Health Facility Catchment Area (HFCA)	Neighborhood Health Committee (NHC)	Targeted to receive IRS within 12 months prior to 2023 KAP Survey
Southern	Livingstone	Libuyu	Zone A	Yes (March 2023)
			Zone B	Yes (March 2023)
			Zone C	Yes (March 2023)
			Zone D	Yes (March 2023)
			Nyanzabili A	Yes (March 2023)
			Nyanzabili B	Yes (March 2023)
			Chaba	Yes (March 2023)
			Tusole	Yes (March 2023)
			Nkotuli	Yes (March 2023)
		Nakatindi	Libes	Yes (March 2023)
			Kashitu	Yes (March 2023)
			Indeco	Yes (March 2023)
			Nakatindi	Yes (March 2023)
			Morelite	Yes (March 2023)
	Kazungula	Kazungula	Mwanga A	No
			Mwanga B	No
			Kazungula A	No
			Kazungula B	No
			Kapanda	No
			Lumbo	No
			Mwiya	No
			Sikombwa	No
			Katoya	No
			Kazala	No
		Sing'ombe	No	
		Mambova	Namapande A	No
			Namapande B	No
			Kazuni	No
Kapolota	No			
	Machenje	No		
	Ngweeze	No		
	Kabala	No		
	Lupani	No		
	Mambova Central	No		
Western	Sesheke	Zambezi	Zambezi Zone 1	Yes (Sept/Oct 2022)
			Katongozone 2	Yes (Sept/Oct 2022)
			Maondo Zone 3	Yes (Sept/Oct 2022)
			Tahalima	Yes (Sept/Oct 2022)
	Mkusi	Mkusi Central	No	
		Mwanomai	No	

Province	District	Health Facility Catchment Area (HFCA)	Neighborhood Health Committee (NHC)	Targeted to receive IRS within 12 months prior to 2023 KAP Survey	
			Lusu	No	
			Maziba	No	
			Manyekanga	No	
		Mulimambango	Mulimambango Central	Yes (Sept/Oct 2022)	
			Kasisi	Yes (Sept/Oct 2022)	
			Lilonga	Yes (Sept/Oct 2022)	
			Namatwi	Yes (Sept/Oct 2022)	
			Rice	Yes (Sept/Oct 2022)	
		Silumbu	Kapua	Yes (Sept/Oct 2022)	
			Nshwa	Yes (Sept/Oct 2022)	
			Kapeya	Yes (Sept/Oct 2022)	
			Lyomboko	Yes (Sept/Oct 2022)	
			Namikuta	Yes (Sept/Oct 2022)	
			Kaale	Yes (Sept/Oct 2022)	
			Nayanda	Yes (Sept/Oct 2022)	
		Silumbu Static	Yes (Sept/Oct 2022)		
		Mulobezi	Mulobezi	Mulobezi Central	Yes (Sept/Oct 2022)
				Kashitu	Yes (Sept/Oct 2022)
	Nalwama			Yes (Sept/Oct 2022)	
	Situmpa			Yes (Sept/Oct 2022)	
	Lonze 1			Yes (Sept/Oct 2022)	
	Kariba			Yes (Sept/Oct 2022)	
	Machile			Yes (Sept/Oct 2022)	
	Kasima Central			Yes (Sept/Oct 2022)	
	Inyambo			Yes (Sept/Oct 2022)	
	Lonze 2			Yes (Sept/Oct 2022)	
	Tower			Yes (Sept/Oct 2022)	
	Shangombo	Shangombo	Liyuwayuwa	Yes (Oct/Nov 2022)	
			Mboiwa	Yes (Oct/Nov 2022)	
			Katukule	Yes (Oct/Nov 2022)	
			Lihonge	Yes (Oct/Nov 2022)	
			Shalitata	Yes (Oct/Nov 2022)	
			Musa	Yes (Oct/Nov 2022)	
Kabungu			Yes (Oct/Nov 2022)		
Make			Yes (Oct/Nov 2022)		
Shandambi			Yes (Oct/Nov 2022)		
Likwangelui			Yes (Oct/Nov 2022)		
Kasima			Yes (Oct/Nov 2022)		
Namatanda			Yes (Oct/Nov 2022)		
Shangombo Central		Yes (Oct/Nov 2022)			
Sipuma		Lyamaya	Yes (Oct/Nov 2022)		
	Lilondo	Yes (Oct/Nov 2022)			
	Sibuku	Yes (Oct/Nov 2022)			

Province	District	Health Facility Catchment Area (HFCA)	Neighborhood Health Committee (NHC)	Targeted to receive IRS within 12 months prior to 2023 KAP Survey
			Sipuma Central	Yes (Oct/Nov 2022)
			Shalimba	Yes (Oct/Nov 2022)
			Manwi	Yes (Oct/Nov 2022)
			Camp 8	Yes (Oct/Nov 2022)
			Nombwe	Yes (Oct/Nov 2022)
			Fuo	Yes (Oct/Nov 2022)
			Sipuma West	Yes (Oct/Nov 2022)
	Senanga	Lui River	Lipuwe	Yes (Oct 2022)
			Lui Mweemba	Yes (Oct 2022)
			Liongo	Yes (Oct 2022)
			Naliongo	Yes (Oct 2022)
			Namuotndo	Yes (Oct 2022)
			Sinanda	Yes (Oct 2022)
			Siyombo	Yes (Oct 2022)
	Mongu	Simulumbe	Ituku East:	Yes (Sept/Oct 2022)
			Ituku West:	Yes (Sept/Oct 2022)
			Kaongeta:	Yes (Sept/Oct 2022)
			Loongo:	Yes (Sept/Oct 2022)
			Miluwe:	Yes (Sept/Oct 2022)
			Mulumba:	Yes (Sept/Oct 2022)
			Simulima:	Yes (Sept/Oct 2022)
	Simulumbe:	Yes (Sept/Oct 2022)		
	Kalabo	Sishekano	Lwamutu	No
			Mwabata	No
			Silinsi	No
			Lushi	No
			Sishekanu	No
		Kuuli	Kashenaba	No
			Kuuli static	No
			Liuwa	No
Lunde			No	
Sibemi			No	
Munde			No	
Lukoko		Libunga	No	
		Sitoya	No	
	Mabula	No		

Province	District	Health Facility Catchment Area (HFCA)	Neighborhood Health Committee (NHC)	Targeted to receive IRS within 12 months prior to 2023 KAP Survey	
		Lumei	Samvu	No	
			Lumei Central	No	
			Masima	No	
		Mishulundu	Nakashinde	No	
			Kanyika	No	
			Maoma	No	
			Munyanya	No	
			Mutembo	No	
			Muyeye	No	
			Siliya	Yes (Oct 2022)	
		Mulinga	Kashimba	Yes (Oct 2022)	
			Liwina	Yes (Oct 2022)	
			Mulinga	Yes (Oct 2022)	
			Sikenge	Yes (Oct 2022)	
			Nan'ole	Yes (Oct 2022)	
			Simangu	Yes (Oct 2022)	
		Sikongo	Sikongo Central	Malondo	Yes (Nov 2022)
				Muwelo	Yes (Nov 2022)
	Nene			Yes (Nov 2022)	
	Lyasimu			Yes (Nov 2022)	
	Sibuo			Yes (Nov 2022)	
	Luwe			Yes (Nov 2022)	
	Muweshi			Yes (Nov 2022)	
	Sishosho			Yes (Nov 2022)	
	Ngulumani			Yes (Nov 2022)	
	Utokota			Yes (Nov 2022)	
	Sikongo Central			Yes (Nov 2022)	
	Sipwechia			Yes (Nov 2022)	
	Liundu		Likala	Yes (Nov 2022)	
			Lounde	Yes (Nov 2022)	
			Katongo	Yes (Nov 2022)	
			Nangulwe	Yes (Nov 2022)	
			Sambao	Yes (Nov 2022)	
			Nesha	Yes (Nov 2022)	
	Situlu		Kaenyi	Yes (Nov 2022)	
			Nomai	Yes (Nov 2022)	
			Kaale	Yes (Nov 2022)	
			Sishwanga	Yes (Nov 2022)	
			Liolelo	Yes (Nov 2022)	
			N'anda	Yes (Nov 2022)	

## **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.