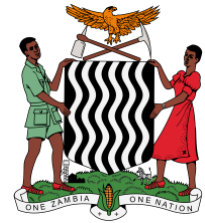


J.C. FLOWERS  
FOUNDATION



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

**Results from Zambia Program Areas  
Data collected between 12 April and 20 May 2022**

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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”) among community members living within 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: reported use of and access to insecticide treated nets (ITNs); reported 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 children under five years with fever in the previous two weeks; knowledge of the cause of malaria, its symptoms, and its mitigation; and attitudes towards ITNs, IRS, and IPTp. 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 District, Provincial, or National level. However, the results at the level of the Health Facility Catchment Area (HFCA) are representative of the general population in each HFCA, since IFCBMI program areas cover HFCAs in their geographical entirety. A full listing of IFCBMI Zambia program areas can be found in Appendix 1. Key results from the 2022 KAP Survey is below:

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

*Households generally used the ITNs that they own, but there is not enough ITNs in good condition to cover everyone in the household.*

Across all program areas, 85% of households own at least one ITN, but only 64% own at least one ITN in good condition. Even fewer households (30%) owned at least one ITN for every two people who slept in the household the previous night, and only 16% of households owned at least one ITN in good condition for every two people who slept in the household the previous night.

ITN use (proportion of people who slept under an ITN the night before the survey) increases by the level of household ITN ownership and the condition of the ITNs. Among all surveyed households, 66% of people slept under an ITN the previous night. However, among households that own at least one ITN for every two people, 93% of people slept under an ITN the previous night, and 96% did so among households that own 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.

Across all Zambia program areas in 2022, ITN use by children <5 the previous night decreased significantly from 85% in 2021 to 80% in 2022 ( $p<0.001$ ). However, ITN use by children <5 (80%) and pregnant women (80%) are higher than ITN use by the general population (66%), indicating that, in general, children <5 and pregnant women are being prioritized for ITN use when there are not enough ITNs to cover everyone.

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

*In areas targeted to receive IRS within 12 months prior to the survey, 83% of households reported being sprayed. Five out of nine District-level program areas achieved or surpassed the World Health Organization (WHO) target of  $\geq 85\%$  of households sprayed with IRS.*

Among households located in areas that were targeted for IRS within 12 months prior to the survey, household IRS coverage reached WHO-recommended levels ( $\geq 85\%$ ) within program areas in Kazungula, Mulobezi, Senanga, Sesheke, and Shangombo Districts. Among all surveyed households, regardless of whether they were targeted to receive IRS within 12 months prior to the survey, the proportion that received IRS within the past 12 months increased significantly from 63% in 2021 to 70% in 2022 ( $p<0.001$ ).

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

*Many children <5 with fever in the previous two weeks 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 and almost all children who tested positive for malaria received Coartem for malaria treatment.*

Across all Zambia 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 66% of children <5 with fever 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, 88% received a blood test for malaria. Among children who were tested for malaria, 63% tested positive for malaria. Among children who tested positive for malaria, 95% received Coartem for malaria treatment, a statistically significant increase from 88% in 2021 ( $p=0.002$ ).

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

*Many respondents reported taking three or more (3+) doses of IPTp during their pregnancy, though there is room for improvement.*

Across all Zambia program areas in 2022, 87% of respondents who gave birth in the previous 12 months reported taking 3+ doses of IPTp during their pregnancy. Between 2021 and 2022, IPTp 3+ increased significantly within program areas in Livingstone ( $p=0.033$ ), Mongu ( $p=0.034$ ), and Senanga ( $p<0.001$ ), but decreased drastically in Sikongo program areas from 73% in 2021 to 48% in 2022 ( $p=0.005$ ).

### **Knowledge and attitudes**

*Malaria knowledge was high, and the majority believed that key malaria mitigation efforts (ITNs, IRS, and IPTp) help prevent malaria.*

The proportion of respondents, among all Zambia program areas, who identified “fever” or “feeling cold/chills” as a symptom of malaria increased significantly between 2021-2022, from 95% to 98% ( $p<0.001$ ). 87% of respondents identified the mosquito as the cause of malaria transmission (and listed nothing else incorrect).

## **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 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 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) 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
- 2) assess knowledge of the cause of malaria and its symptoms
- 3) understand attitudes toward ITNs, IRS, and IPTp

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 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 District, Provincial, or National level. However, the results at the Health Facility Catchment Area (HFCA) level are representative of the general population in each HFCA, since IFCBMI program areas cover HFCAs in their geographical entirety. 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.

### Section 3. Methodology

#### Sampling frame and sample size

The sampling frame for the 2022 KAP Survey was all IFCBMI program areas in Zambia (Appendix 1). The 2022 sample size was determined to be a minimum of 2000 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, 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 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 District, Provincial, or National level. However, the results at the Health Facility Catchment Area (HFCA) level are representative of the general population in each HFCA, since IFCBMI program areas cover HFCAs in their geographical entirety.

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

Province	District	Health facility catchment area (HFCA)	Sample sizes		
			2020	2021	2022
Southern	Kazungula	Kazungula	221	219	216
		Mambova	101	95	86
	Livingstone	Libuyu	430	371	301
		Nakatindi	243	188	145
Western	Kalabo	Kuuli	47	73	55
		Lukoko*	-	16	12
		Lumei	37	18	12
		Mishulundu	36	46	30
		Mulinga	18	61	40
		Sishekano	37	37	20
		Mongu	Simulumbwe	127	115
	Mulobezi	Mulobezi	183	150	107
	Senanga	Lui River	103	120	68
		Sesheke	Mkusi	121	89
	Mulimambango		139	150	122
	Silumbu		86	45	37
	Zambezi		195	120	95
	Shangombo	Shangombo	217	227	167
		Sipuma	136	165	112
	Sikongo	Liundu*	-	34	26
		Sikongo Central	165	148	126
		Situlu	83	54	38
<b>TOTAL:</b>			2725	2541	1982
<b>Response rate:</b>			98%	97%	96%

\*Data not collected in 2020

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

Year	Dates of data collection
2020	6 July – 22 August
2021	10 May – 16 June
2022	12 April – 23 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 Zambia program areas (2022)**

<b>Background characteristic</b>	
Average age of respondent (n)	33.1
Percent of households with at least one child under 5 who slept there the previous night (%)	69
Average number of children <5 in household the previous night, among households with at least one child <5 (n)	1.4
Percent of 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)	5.4
Average number of sleeping spaces (n)	2.7
Percent of households with surrounding standing water, per visual observation of data collector (%)	12

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

<b>Education level</b>	<b>percent</b>	<b>number</b>
Never attended school	13	248
Attended some primary school	19	373
Completed primary school	17	330
Attended some secondary school	24	468
Completed secondary school	20	389
Higher than secondary school	8	152
Not sure	0	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 the most recent vector control campaign.

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 2020-2022. Across all Zambia program areas, the proportion of households that own at least one ITN decreased significantly from 89% in 2021 to 85% in 2022 ( $p < 0.001$ ) and the proportion of households that own at least one ITN for every two people who slept in the household the previous night decreased significantly from 39% in 2021 to 30% in 2022 ( $p < 0.001$ ). Mirroring this trend of decreased ITN ownership levels from 2021-2022, 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 71% in 2021 to 62% in 2022 ( $p < 0.001$ ) and the proportion of people who used an ITN the previous night also decreased significantly from 72% in 2021 to 66% in 2022,  $p < 0.001$ .

**Figure 1. ITN access, use, and ownership (%), all Zambia program areas (2020-2022)**

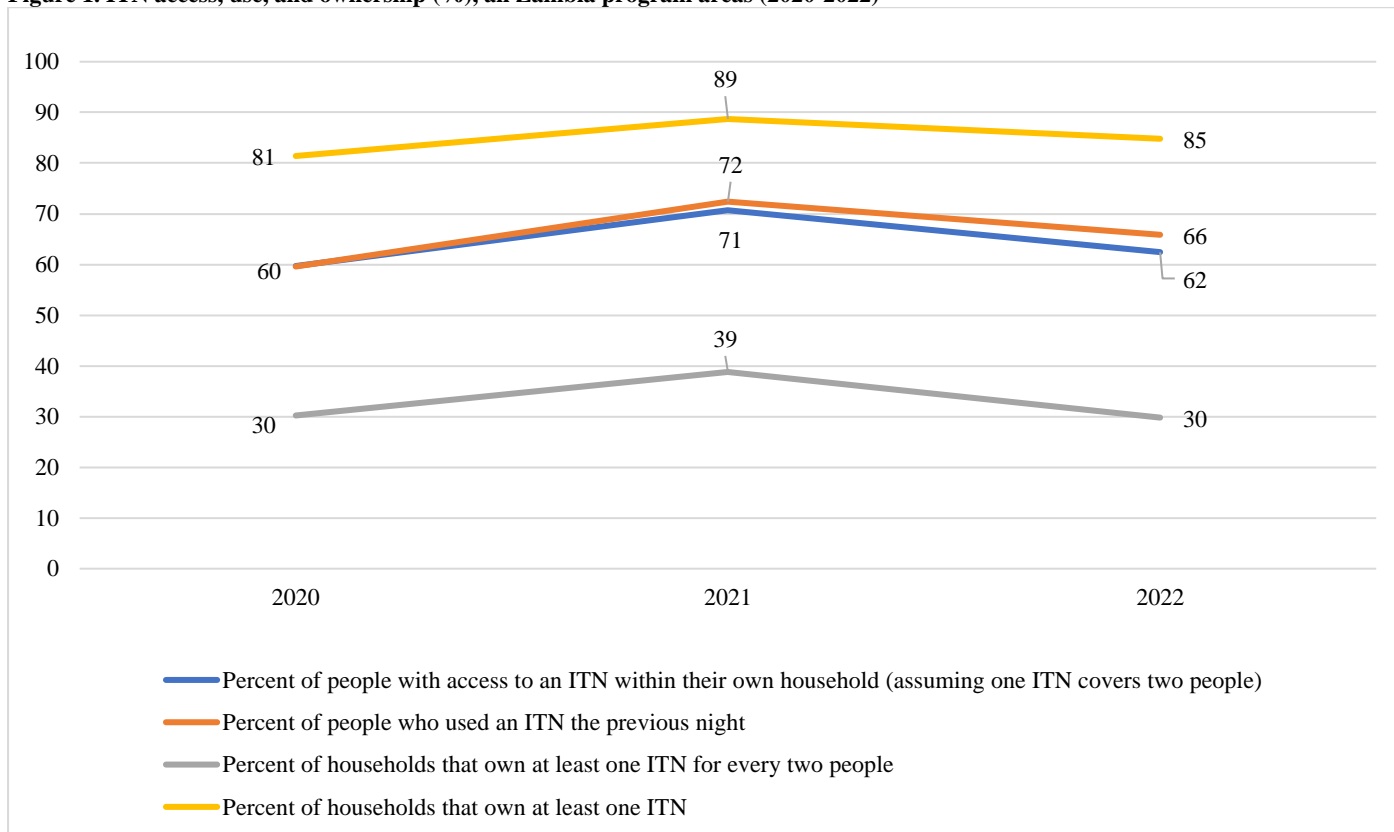


Figure 2. shows varying levels of ITN ownership among program areas at the District level. Overall, while 85% of households own at least one ITN, only 64% own at least one ITN in good condition, defined as not having any holes larger than a thumb (condition of ITNs was reported only, not confirmed visually). Even fewer households (30%) owned at least one ITN for every two people who slept in the household the previous night, and only 16% 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 District level. Program areas within Senanga District had the highest ITN ownership levels, while program areas in Shamgombo and Sikongo had the lowest.



**Figure 2. Household ownership of ITNs (%), by program areas at the District level (2022)**

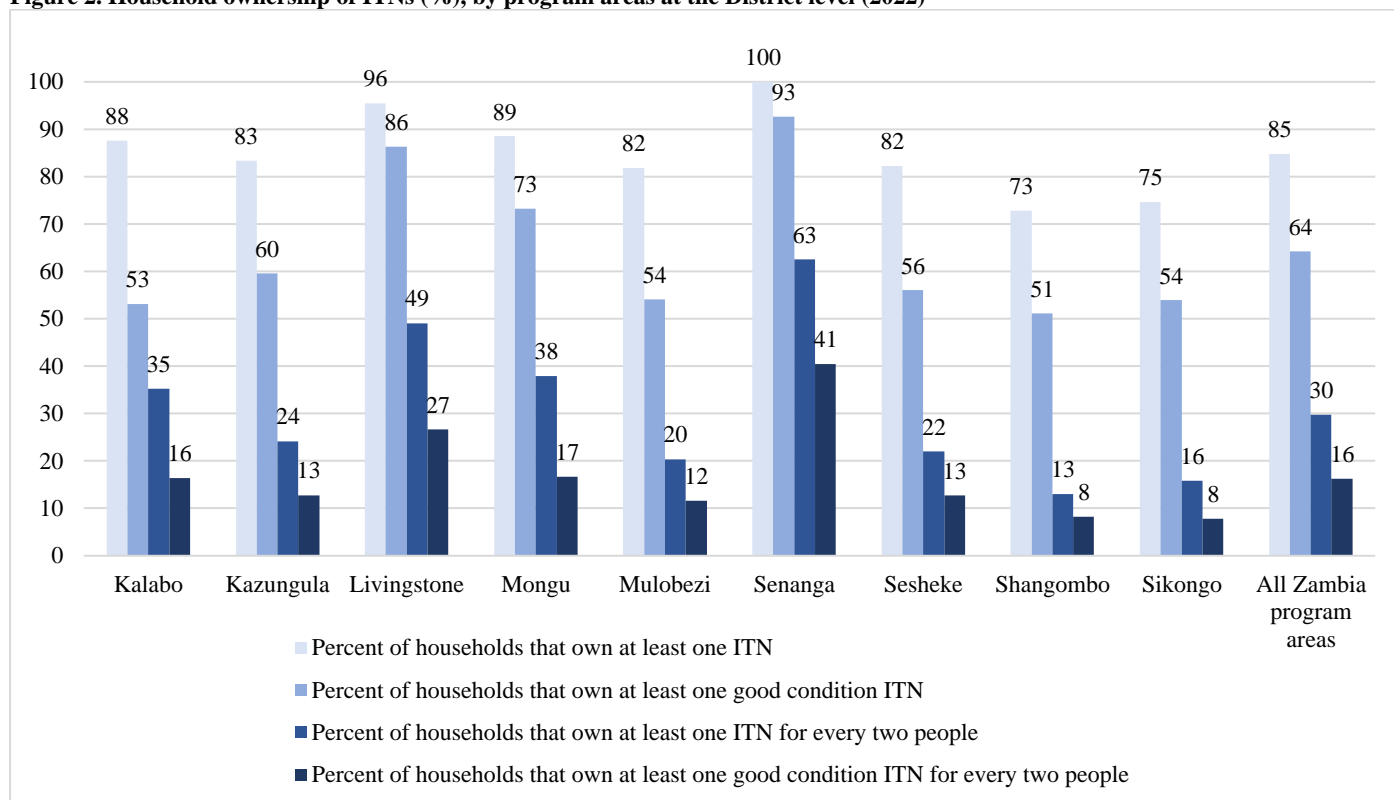


Table 5. shows ownership of ITNs at the level of the Health Facility Catchment Area.

**Table 5. Household ownership of ITNs, by Health Facility Catchment Areas (2022)**

Province	District	HFCA	Percent of households that have at least one ITN	Percent of households that have at least one ITN in good condition	Percent of households that have at least one ITN for every 2 people who slept there the previous night	Percent of households that have at least one good condition* ITN for every 2 people who slept there the previous night	Average number of ITNs per household
			%	%	%	%	n
Southern	Kazungula	Kazungula	81	58	26	12	1.6
		Mambova	88	63	21	14	1.8
	Livingstone	Libuyu	96	86	49	23	2.1
		Nakatindi	95	87	49	35	2.5
Western	Kalabo	Kuuli	82	49	30	11	1.3
		Lukoko	85	85	38	30	2.0
		Lumei	100	50	0	0	1.7
		Mishulundu	93	47	33	14	1.5
		Mulinga	90	56	51	26	1.8
		Sishekanu	47	35	35	15	1.4
		Mongu	Simulumbwe	89	73	38	17
	Mulobezi	Mulobezi	82	54	20	12	1.5
	Senanga	Lui River	100	93	63	41	2.6
	Sesheke	Mkusi	98	93	33	24	2.0
		Mulimambango	75	37	20	7	1.5
		Silumbu	84	79	30	22	1.7
		Zambezi	78	40	12	6	1.4
	Shangombo	Shangombo	72	44	11	6	1.3
		Sipuma	74	63	16	12	1.4
Sikongo	Sikongo Central	75	52	17	7	1.3	
	Liundu	73	49	15	8	1.6	
	Situlu	76	66	13	11	1.2	
<b>All Zambia program areas</b>			<b>84</b>	<b>64</b>	<b>29.8</b>	<b>16</b>	<b>1.7</b>

\*good condition was defined as not having any holes larger than a thumb

Figure 3. shows the proportion of pregnant women who slept under an ITN the previous night from 2020-2022. Across all Zambia program areas in 2022, ITN use by pregnant women (80%) is higher than ITN use by the general population (66%, 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. Among program areas at the District level, ITN use by pregnant women in 2022 varies widely, from only 43% of pregnant women sleeping under an ITN the previous night in Sikongo program areas to 95% in Senanga program areas. Pregnant women are sleeping under ITNs at higher levels than the general population in all program areas except those in Kalabo District where they used ITNs at lower levels than the general population (48%, shown in Figure 3 versus 60%, shown in Figure 5). Between 2021-2022, the proportion of pregnant women who slept under an ITN the previous night decreased in all program areas except those in Mongu and Sesheke Districts; however, all changes among program areas at the District level were non-significant.

**Figure 3. Percent of pregnant women who slept under an ITN the previous night, by program areas at the District level (2020-2022)**

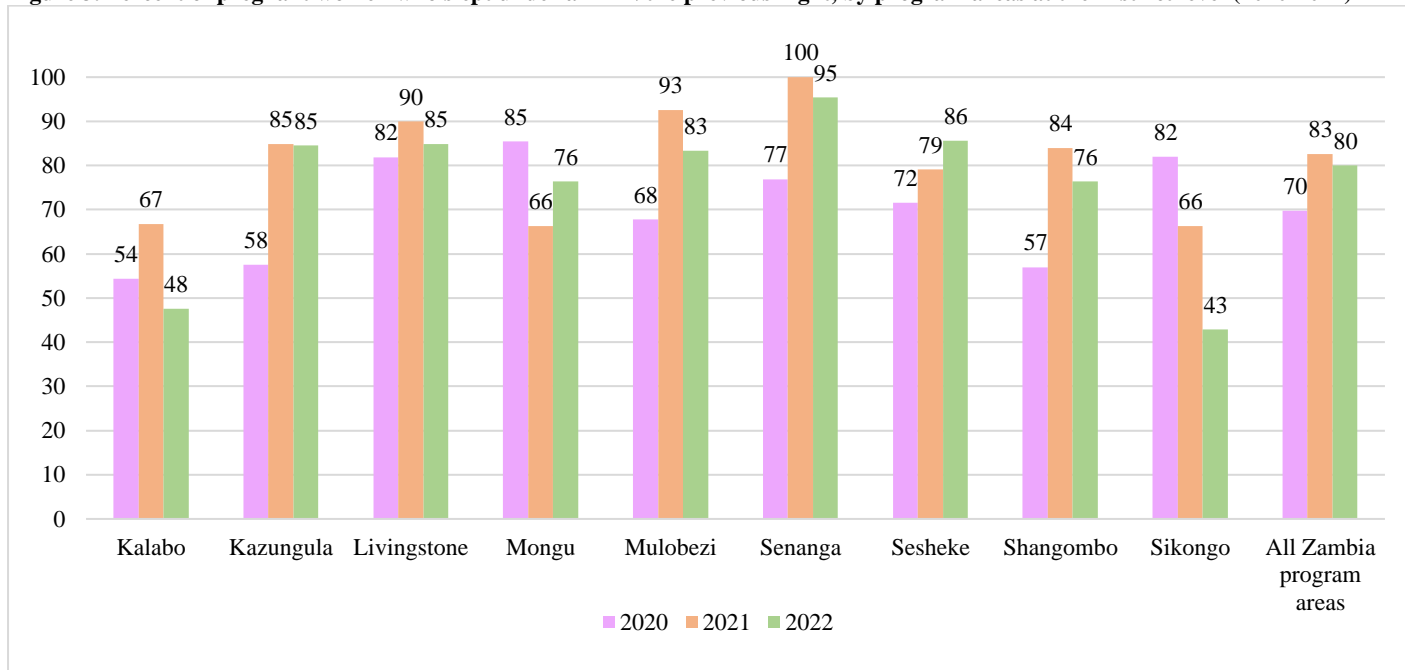


Figure 4. shows the proportion of children <5 who slept under an ITN the previous night from 2020-2022. Across all Zambia program areas in 2022, ITN use by children <5 the previous night decreased significantly from 85% in 2021 to 80% in 2022 ( $p < 0.001$ ), but is still higher than ITN use by the general population (66%), 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 District level, ITN use by children <5 the previous night in 2022 varied widely, from 54% in Sikongo program areas to 94% in Senanga program areas in 2022. The proportion of children <5 who slept under an ITN the previous night decreased significantly within program areas in Kalabo ( $p = 0.035$ ), Shangombo ( $p = 0.01$ ) and Sikongo ( $p < 0.001$ ) Districts.

**Figure 4. Percent of children <5 who slept under an ITN the previous night, by program areas at the District level (2020-2022)**

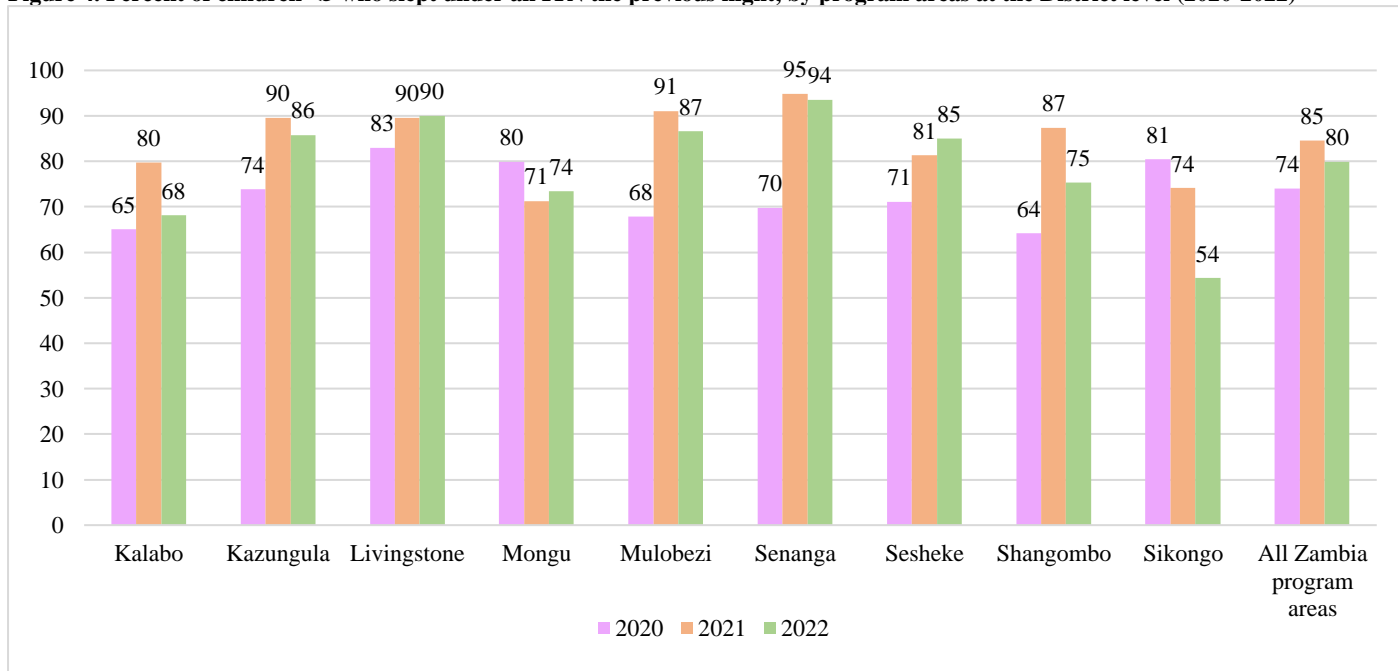


Figure 5 shows the proportion of people who slept under an ITN the previous night among all households, among households that own at least one ITN for every two people who slept there the previous night, and among households that own at least one good condition ITN for every two people who slept there the previous night. The proportion of people who slept under an ITN the previous night increases when considering whether the household owns enough ITNs to cover everyone in the household, and increases further when considering the condition of the ITNs. While only 66% of people used an ITN the previous night among all surveyed households in Zambia regardless of ITN ownership status, ITN use increased to 93% when looking only at households that own at least one ITN for every two people and increased further to 96% when looking only at households that own at least one good condition ITN for every two people. This suggests that people will use ITNs if they have access to ITNs, especially access to ITNs in good condition.

**Figure 5. Percent of people who slept under an ITN the previous night by household ITN ownership, by program areas at the District level (2022)**

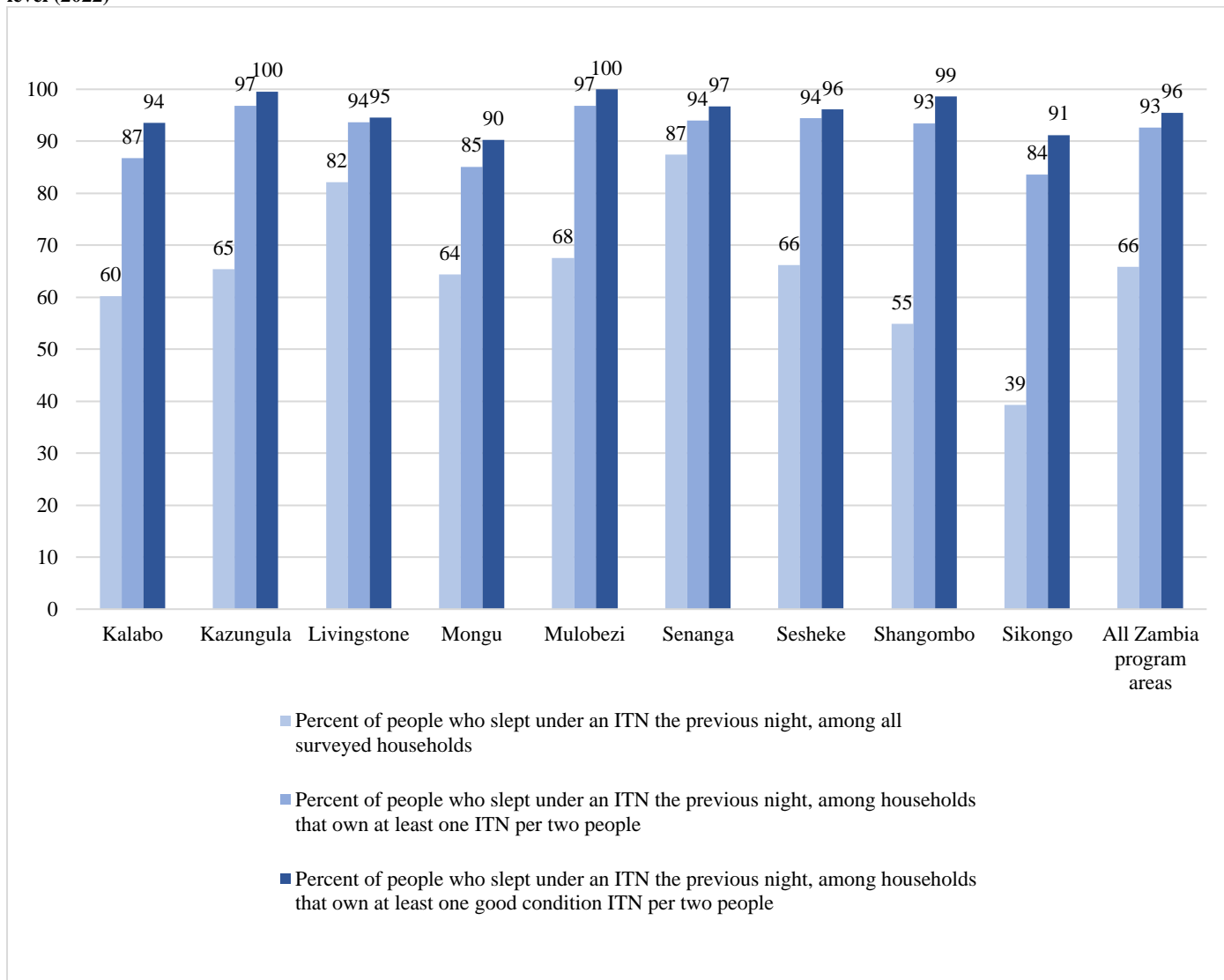


Table 6. shows, at the HFCA level, ITN use (proportion of people who slept under an ITN the previous night) by the general population, pregnant women, and children <5, as well as ITN use by varying levels of household ITN ownership (among all surveyed households, among households that own at least one 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 6. 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 Health Facility Catchment Area (2022)**

Province	District	HFCA	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 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)
			%	%	%	%	%
Southern	Kazungula	Kazungula	78	82	65	97	100
		Mambova	94	96	66	95	99
	Livingstone	Libuyu	90	91	82	94	94
		Nakatindi	74	89	82	94	95
Western	Kalabo	Kuuli	56	59	57	80	84
		Lukoko	0	79	66	92	96
		Lumei	67	92	73	0	0
		Mishulundu	53	67	60	92	100
		Mulinga	76	0	64	84	94
		Sishekanu	100	56	51	100	100
	Mongu	Simulumbwe	76	74	64	85	90
	Mulobezi	Mulobezi	83	87	68	97	100
	Senanga	Lui River	95	94	87	94	97
	Sesheke	Mkusi	96	96	81	92	95
		Mulimambango	82	78	59	97	97
		Silumbu	100	86	73	88	96
		Zambezi	81	83	61	100	100
	Shangombo	Shangombo	70	72	53	90	98
		Sipuma	85	81	58	97	99
	Sikongo	Sikongo Central	47	54	38	78	86
		Liundu	34	55	41	100	100
		Situlu	34	55	43	100	100
	<b>All Zambia program areas</b>			<b>80</b>	<b>80</b>	<b>66</b>	<b>93</b>

\*good condition was defined as not having any holes larger than a thumb

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 6 shows the ITN Use:Access Ratio from 2020-2022. Among program areas at the District level, ITN Use:Access Ratios have remained over 0.90 and in most cases above 1.0 from 2020-2022. Across all Zambia program areas, between 2021-2022 there was a significant increase in the ITN Use:Access Ratio, from 1.06 in 2021 in to 1.10 in 2022,  $p=0.001$ , despite a significant decrease in ITN ownership from 2021-2022 (shown in Figure 1). This indicates that desired ITN use behavior is high and most people will use ITNs if they have them, suggesting that the main driver of ITN use is access to ITNs.

**Figure 6. ITN Use:Access Ratio, by program areas at the District level (2020-2022)**



Table 7. shows access to ITNs, access to good condition ITNs, and the ITN Use:Access Ratio at the HFCA level.

**Table 7. ITN access and ITN Use:Access Ratio, by Health Facility Catchment Area (2022)**

Province	District	HFCA	Percent of people with access to an ITN, assuming 1 ITN covers 2 people, household average	Percent of people with access to a good condition* ITN, assuming 1 ITN covers 2 people, household average	ITN Use:Access Ratio, household average
			%	%	ratio
Southern	Kazungula	Kazungula	61	37	1.10
		Mambova	62	41	1.08
	Livingstone	Libuyu	80	59	1.06
		Nakatindi	81	65	1.04
Western	Kalabo	Kuuli	59	30	1.13
		Lukoko	68	59	1.03
		Lumei	63	26	1.16
		Mishulundu	65	29	1.02
		Mulinga	76	45	0.85
		Sishekanu	58	27	0.80
	Mongu	Simulumbe	69	50	0.96
	Mulobezi	Mulobezi	57	34	1.27
	Senanga	Lui River	87	72	1.03
	Sesheke	Mkusi	74	64	1.14
		Mulimambango	53	22	1.14
		Silumbu	66	55	1.16
		Zambezi	50	21	1.26
	Shangombo	Shangombo	43	21	1.33
		Sipuma	47	31	1.36
	Sikongo	Sikongo Central	44	27	0.89
Liundu		44	26	1.02	
Situlu		42	33	1.00	
<b>All Zambia program areas</b>			<b>62</b>	<b>41</b>	<b>1.10</b>

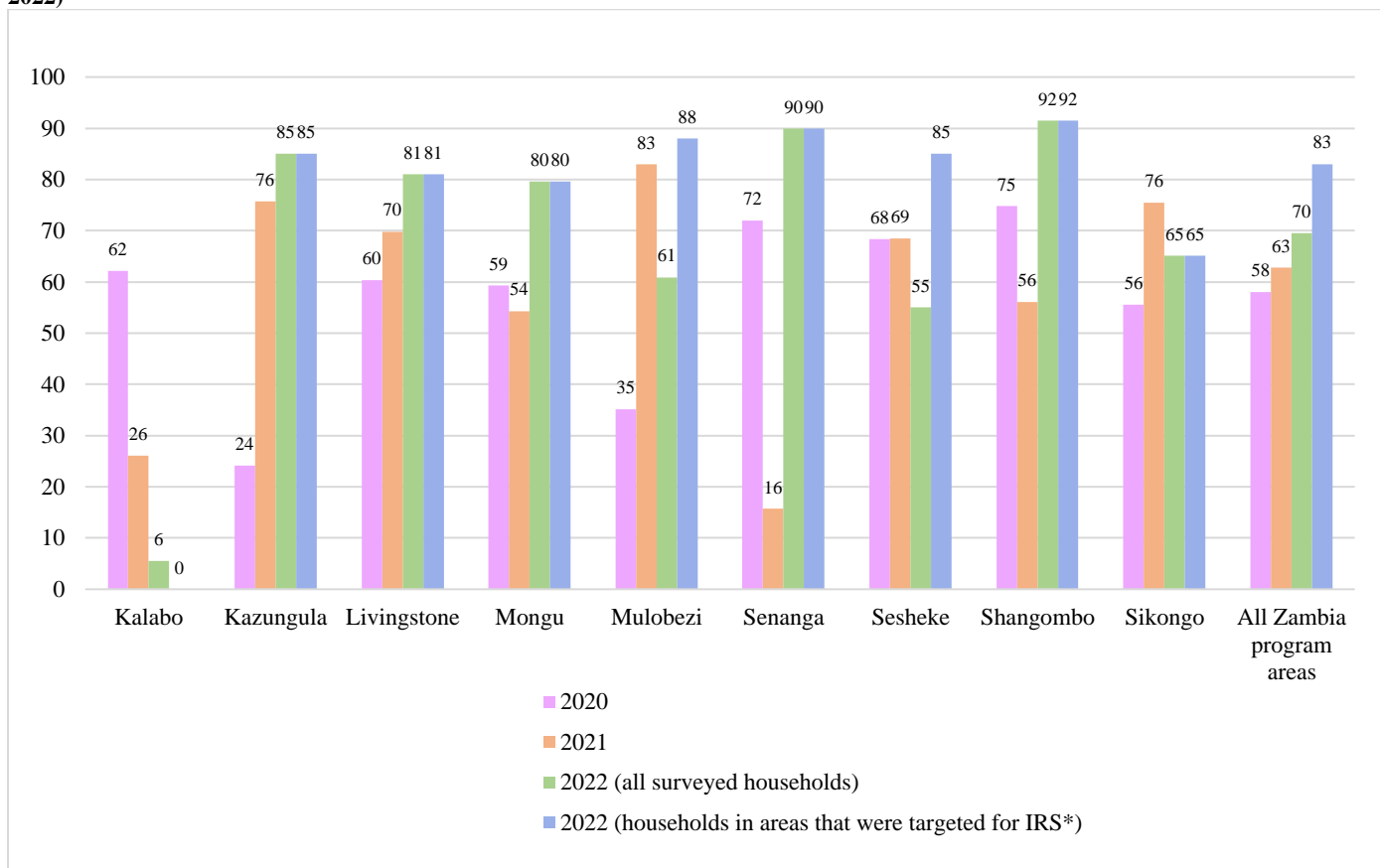
\*good condition was defined as not having any holes larger than a thumb

Indoor residual spraying (IRS)

Figure 7 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 were targeted to receive IRS within 12 months prior to the survey, and thus the household IRS coverage indicator includes both areas that were targeted for IRS and those that were not (program areas that were targeted to receive IRS within the 12 months prior to the survey can be found in Appendix 1). To address this, a separate calculation for household IRS coverage was conducted for the 2022 survey year results, among only households that were located in areas targeted to receive 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 increased significantly from 63% (2021 survey) to 70% (2022 survey),  $p < 0.001$ . When looking only households that were located in areas targeted to receive IRS within 12 months prior to the survey, 83% of households received IRS. Among program areas at the District level, household IRS coverage reached WHO-recommended levels ( $\geq 85\%$ ) within Kazungula, Mulobezi, Senanga, Sesheke, and Shangombo Districts when looking only at households located in areas targeted to receive IRS within 12 months prior to the survey.

**Figure 7. Percent of households that received IRS within 12 months prior to the survey, by program areas at the District level\* (2020-2022)**



\*Program areas that were targeted to receive IRS within the 12 months prior to the survey can be found in Appendix 1.

Table 8. shows, at the HFCA level, the percent of households that received IRS and the percent of people who slept the previous night in a room that was sprayed with IRS within the previous 12 months, among only households located in areas that were targeted to receive IRS within 12 months prior to the survey. Household IRS coverage reached WHO-recommended levels ( $\geq 85\%$ ) within Mambova (89%), Mulobezi (88), Lui River (90%), Zambezi (90%), Shangombo (93%), and Sipuma (90%) HFCA.

**Table 8. Household and population coverage of indoor residual spraying (IRS) within 12 months prior to the survey, by Health Facility Catchment Area\* (2022)**

Province	District	HFCA	Households sprayed with IRS within the previous 12 months, among households in areas targeted for IRS		People who slept the previous night in a room that was sprayed with IRS within the previous 12 months, among households in areas targeted for IRS
			%	n	%
Southern	Kazungula	Kazungula	84	181	82
		Mambova	89	76	88
	Livingstone	Libuyu	82	56	80
		Nakatindi	80	116	70
Western	Mongu	Simulumbwe	20	17	69
	Mulobezi	Mulobezi	88	50	88
	Senanga	Lui River	90	60	88
	Sesheke	Mulimambango	81	99	81
		Zambezi	90	85	89
	Shangombo	Shangombo	93	153	92
		Sipuma	90	100	90
	Sikongo	Sikongo Central	64	81	56
		Liundu	68	18	59
Situlu		66	25	61	
<b>All Zambia program areas*</b>			83	1357	80

\*HFCA not listed were not targeted for IRS in the most recent IRS campaign. A full listing of targeted areas 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. Figure 8 displays reasons why these households did not receive IRS, among only households located in areas that were targeted to receive IRS within the 12 months prior to the survey. Among households located in areas that were targeted to receive IRS but reportedly did not receive IRS within the previous 12 months, the most common reason given for not receiving IRS was “I was not at my household when the spray team came to offer IRS” (50%), followed by “no one came to my household to conduct IRS” (31%). The proportions of people who said that their household “refused IRS” were highest within program areas in Kazungula and Livingstone (15% and 15%, respectively) and lowest within program areas in Mongu, Mulobezi, and Senanga (zero reported refusals).

**Figure 8. Reasons why households did not receive IRS in the previous 12 months (%), 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, by program areas at the District level (2022)**

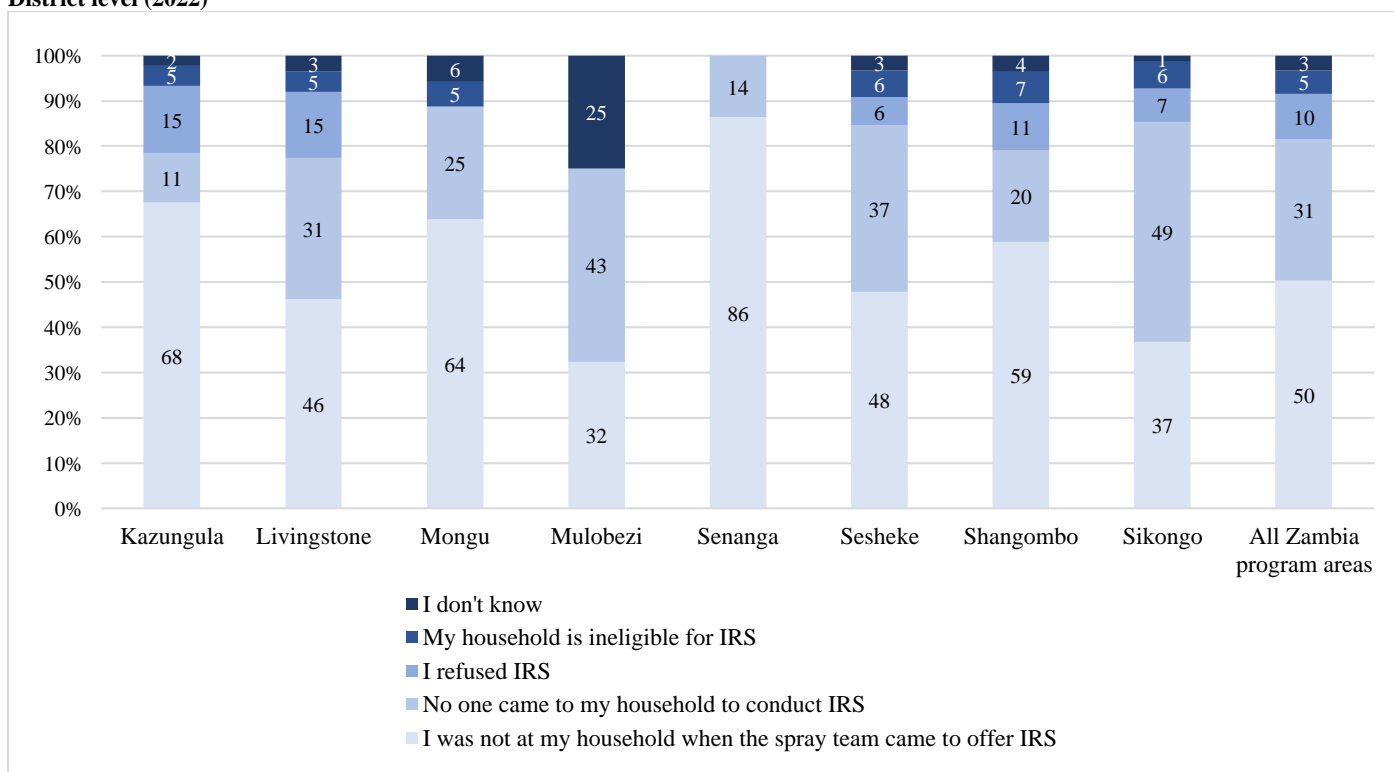


Table 9. shows reasons why households did not receive IRS within the previous 12 months, again among only households that reported not receiving IRS within the previous 12 months but were located in areas that were targeted to receive IRS in the most recent vector control campaign, at the HFCA level.

**Table 9. Reasons why households did not receive IRS in the previous 12 months (number of households), among households that reportedly did not receive IRS in the previous 12 months but were located in areas that were targeted to receive IRS in the most recent IRS campaign, by Health Facility Catchment Area (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
Province	District	HFCA	n	n	n	n	n
Southern	Kazungula	Kazungula	4	23	5	2	1
		Mambova	1	7	2	0	0
	Livingstone	Libuyu	17	26	6	4	3
		Nakatindi	10	13	6	0	0
Western	Mongu	Simulumbe	4	11	0	1	1
	Mulobezi	Mulobezi	3	2	0	0	2
	Senanga	Lui River	1	6	0	0	0
	Sesheke	Mulimambango	9	11	1	1	1
		Zambezi	3	5	1	1	0
	Shangombo	Shangombo	2	7	2	2	0
		Sipuma	3	7	1	0	1
	Sikongo	Sikongo Central	23	18	3	1	0
		Liundu	6	1	1	0	0
		Situlu	3	5	1	3	1
<b>All Zambia program areas</b>			<b>89</b>	<b>142</b>	<b>29</b>	<b>15</b>	<b>10</b>

\*HFCA's not listed were not targeted for IRS in the most recent IRS campaign. A full listing of targeted areas can be found in Appendix 1.



## 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 9, 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 Zambia 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 66% (336/515) 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 seeking care for the child’s fever at all, regardless of the timing in relation to the fever onset; 88% (453/515) of respondents whose child had a fever in the previous two weeks sought care for their child’s fever.

**Figure 9. Cascade of care-seeking behavior (number of respondents with children <5 with fever within the two weeks prior to the survey), all Zambia program areas (2022)**

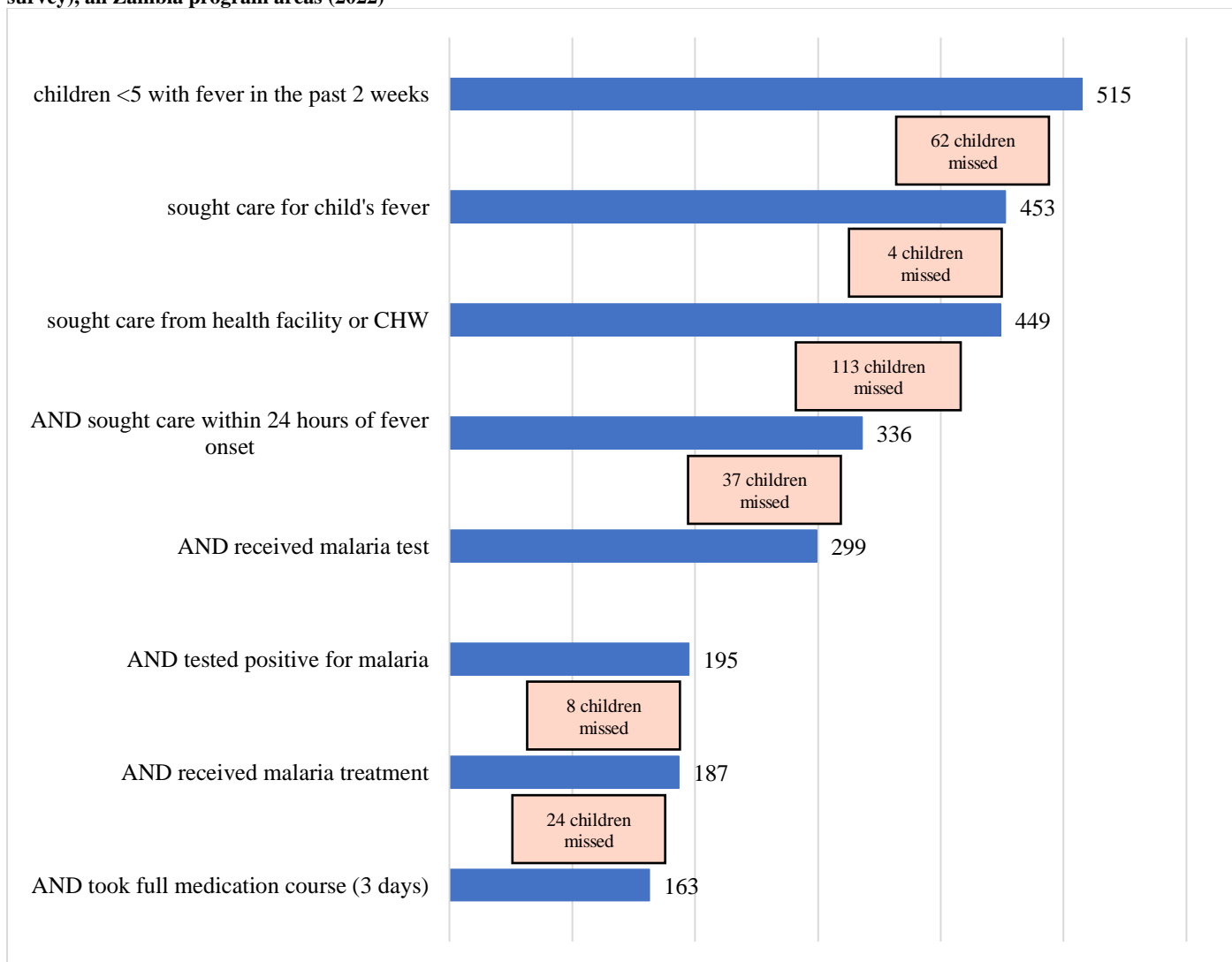


Figure 10 shows the proportion of children <5 with fever who sought care within 24 hours among program areas at the District level. In 2022 across all Zambia program areas, 66% of children <5 with fever in the previous two weeks sought care from a health facility or CHW within 24 hours of the start of the fever (no significant change from 2021). None of the changes within program areas at the District level were statistically significant, likely due in part to smaller subsamples of respondents with children <5 with fever in the previous two weeks.

**Figure 10. 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 District level (2021-2022)**



Figure 11. shows the percent of children <5 who received a blood test for malaria, among those who sought care from a health facility or CHW among program areas at the District program area level. Across all Zambia program areas, among children who sought care from a health facility or CHW in 2022, 88% received a blood test for malaria, a non-significant increase from 86% in 2021. None of the changes within program areas at the District 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 11. 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 District level (2021-2022)**

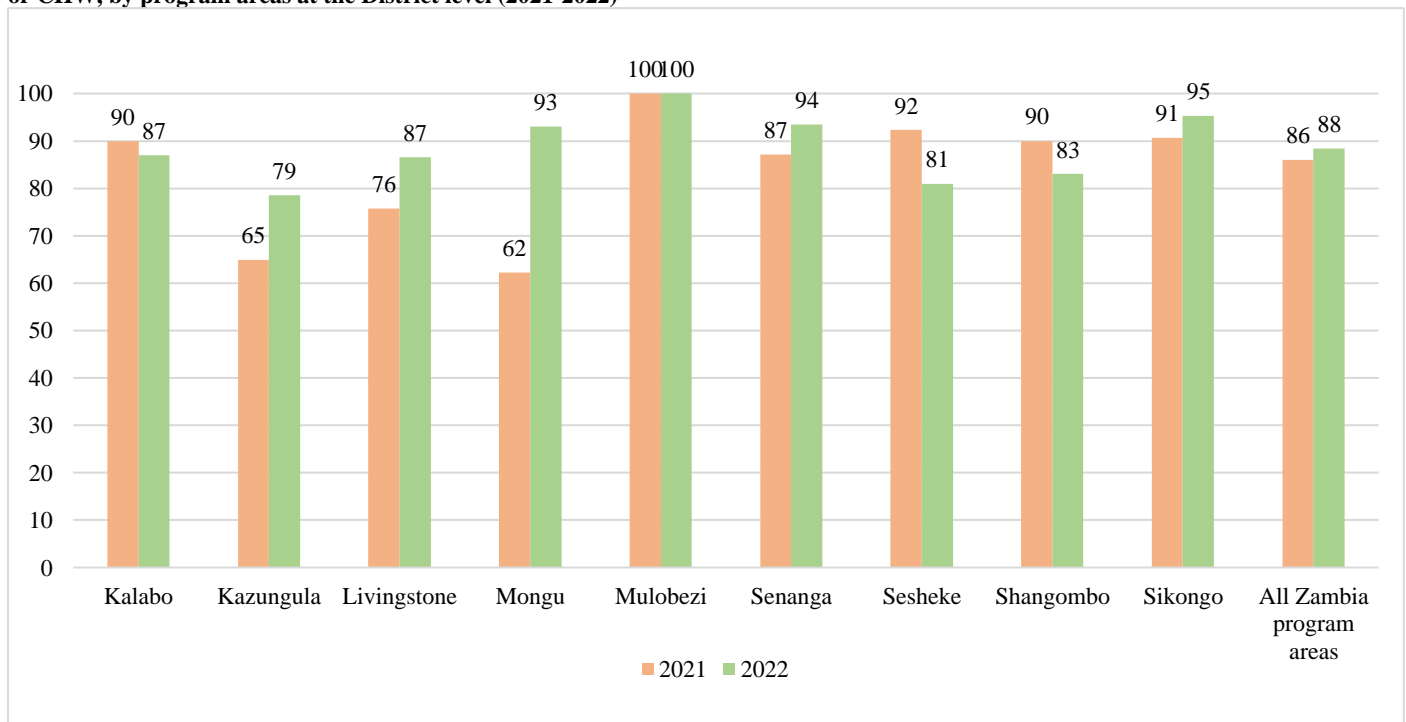


Figure 12 shows the percent of children who received Coartem for malaria treatment, among children who tested positive for malaria. Across all Zambia program areas in 2022, 63% of children who were tested for malaria by a health facility or CHW tested positive for malaria (reported). Across all Zambia program areas, among those children who tested positive for malaria, 95% received Coartem for malaria treatment, a statistically significant increase from 88% in 2021 (p=0.002). Statistically significant increases from 2021-2022 were observed in program areas within Kalabo (p=0.038), Kazungula (p=<0.001), Mongu (p=<0.001), Senanga (p=<0.001), and Shangombo (p=<0.001) Districts. However, a statistically significant decrease in the proportion of children who received Coartem after testing positive for malaria from 2021-2022 was observed among program areas in Mulobezi (p=<0.001).

**Figure 12. Percent of children who received Coartem for malaria treatment, among those children <5 with fever that reportedly tested positive for malaria, by program areas at the District level (2020-2022)**

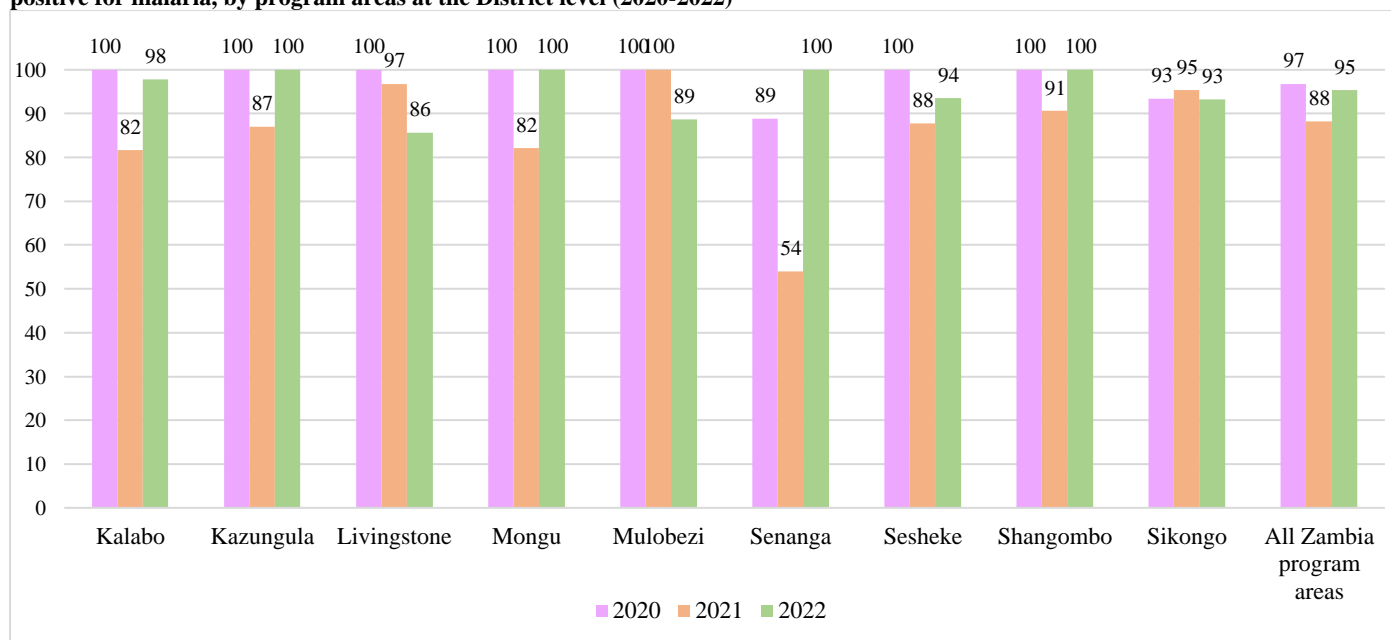


Table 10. shows, at the HFCA level, the number of respondents whose child <5 had a fever in the previous two weeks, the number of children <5 with fever who sought care from a health facility or CHW within 24 hours of fever onset, the number of children with <5 with fever who sought care from a health facility or CHW regardless of timing in relation to the fever onset, the number of children who received a malaria test from a health facility or CHW, and the number children who received malaria treatment among those who tested positive for malaria.

**Table 10. Key indicators of trajectory of care for children <5 with fever in the previous two weeks, by Health Facility Catchment Area (2022)**

Province	District	HFCA	Number of respondents whose child <5 had a fever in the previous two weeks	Number of mothers/ caregivers who sought care for their child from a health facility or CHW and did so within 24 hours of the start of their child's fever	Number of children <5 with fever who sought care from a health facility or CHW (regardless of timing in relation to fever)	Number of children who received a malaria test from a health facility or CHW	Number of children who tested positive for malaria	Number of children who received malaria treatment, among those who tested positive for malaria
Southern	Kazungula	Kazungula	42	24	33	26	11	11
		Mambova	15	11	15	12	6	6
	Livingstone	Libuyu	64	46	57	49	18	17
		Nakatindi	29	18	21	18	9	6
Western	Kalabo	Kuuli	26	18	25	22	22	21
		Lukoko	2	1	1	2	2	2
		Lumei	4	3	3	2	1	1
		Mishulundu	9	6	8	8	5	5
		Mulinga	12	9	12	9	5	4
		Sishekanu	8	6	7	6	5	5
	Mongu	Simulumbe	43	32	43	39	25	25
	Mulobezi	Mulobezi	16	9	12	12	8	7
	Senanga	Lui River	48	42	46	43	24	24
	Sesheke	Mkusi	12	8	11	8	3	3
		Mulimambango	16	11	14	11	6	6
		Silumbu	3	3	3	2	1	0
		Zambezi	11	6	10	10	4	4
	Shangombo	Shangombo	27	17	22	17	10	10
		Sipuma	16	12	14	13	9	9
	Sikongo	Liundu	16	8	12	12	10	9
Sikongo Central		76	37	65	61	51	47	
Situlu		20	9	9	15	15	15	
<b>All Zambia program areas</b>			<b>515</b>	<b>513</b>	<b>449</b>	<b>397</b>	<b>250</b>	<b>237</b>

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

Figure 13 shows the percent of women who gave birth in the previous 12 months that reported taking three or more (3+) doses of IPTp during their pregnancy. Across all Zambia program areas in 2022, 87% of women who gave birth in the previous 12 months reported taking 3+ doses of IPTp during their pregnancy (a non-significant increase from 83% in 2021). Between 2021 and 2022, IPTp 3+ increased in all program areas at the District level except for those in Sikongo, which decreased significantly from 73% in 2021 to 48% in 2022 ( $p=0.005$ ). Increases in the proportions of women who took 3+ doses of IPTp were significant within program areas in Livingstone ( $p=0.033$ ), Mongu ( $p=0.034$ ), and Senanga ( $p<0.001$ ) Districts and non-significant elsewhere.

**Figure 13. Percent of women who gave birth in the previous 12 months that reported taking 3+ doses of IPTp during their pregnancy, by program areas at the District level (2021-2022)**

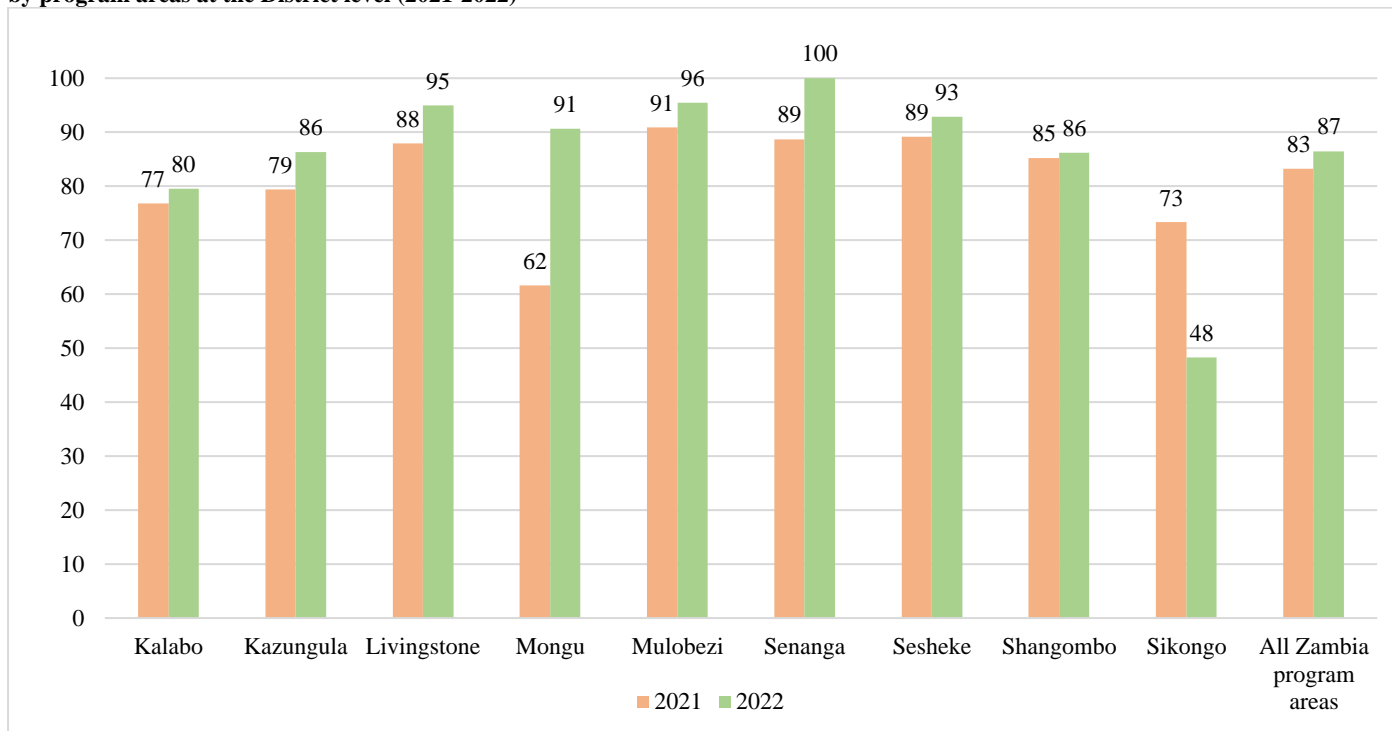


Table 11. shows number of women that gave birth in the previous 12 months who took zero, one, two, or 3+ doses of IPTp during their pregnancy at the HFCA level.

**Table 11. IPTp history among women who gave birth in the previous 12 months, by Health Facility Catchment Area (2022)**

Province	District	HFCA	Number of women who reported giving birth in the previous 12 months	Number of women who took 3+ doses of IPTp	Number of women who took 2 doses of IPTp	Number of women who took one IPTp dose	Number of women who did not take any IPTp during their pregnancy	Number of women who took some IPTp but aren't sure how many doses	
Southern	Kazungula	Kazungula	46	40	2	0	3	1	
		Mambova	20	17	1	0	2	0	
	Livingstone	Libuyu	125	119	1	3	1	1	
		Nakatindi	31	29	0	0	2	0	
	Western	Kalabo	Kuuli	13	10	1	2	0	0
Lukoko			1	1	0	0	0	0	
Lumei			6	5	0	0	1	0	
Mishulundu			5	4	1	0	0	0	
Mulinga			11	9	0	1	1	0	
Sishekanu			3	2	0	0	1	0	
Mongu		Simulumbe	22	20	1	0	1	0	
Mulobezi		Mulobezi	25	24	0	0	0	1	
Senanga		Lui River	19	19	0	0	0	0	
		Sesheke	Mkusi	19	18	0	0	1	0
			Mulimambango	42	38	0	1	3	0
			Silumbu	11	10	0	0	0	1
Shangombo		Zambezi	25	24	0	0	1	0	
		Shangombo	43	35	3	0	4	1	
		Sipuma	16	15	1	0	0	0	
Sikongo		Liundu	9	5	2	1	1	0	
		Sikongo Central	34	18	6	7	0	3	
		Situlu	13	4	1	7	1	0	
<b>All Zambia program areas</b>			<b>539</b>	<b>466</b>	<b>20</b>	<b>22</b>	<b>23</b>	<b>8</b>	

## 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 14. shows the proportion of respondents who identified “fever” or “feeling cold/chills” as a symptom of malaria. This indicator increased significantly from 2021-2022 across all program areas, from 95% to 98% ( $p < 0.001$ ). Significant increases were also observed at the following District level program areas: Kazungula (from 92% to 97%,  $p = 0.014$ ), Livingstone (from 95% to 98%,  $p < 0.001$ ), Senanga (from 96% to 100%,  $p < 0.001$ ), Sesheke (from 95% to 99%,  $p = 0.007$ ), and Shangombo (from 95% to 99%,  $p = 0.003$ ), and is very high (>94%) in all other areas.

**Figure 14. Percent of respondents who identified “fever” or “feeling cold/chills” as a symptom of malaria, by program areas at the District level (2020-2022)**

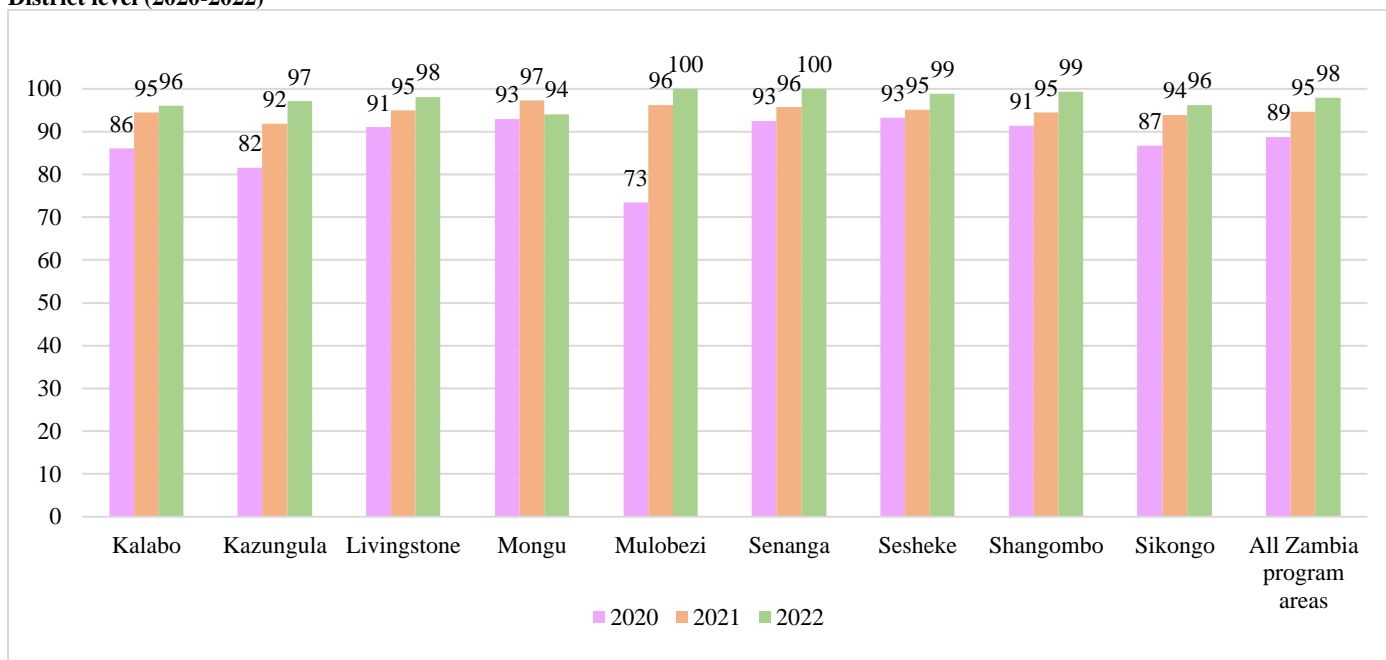
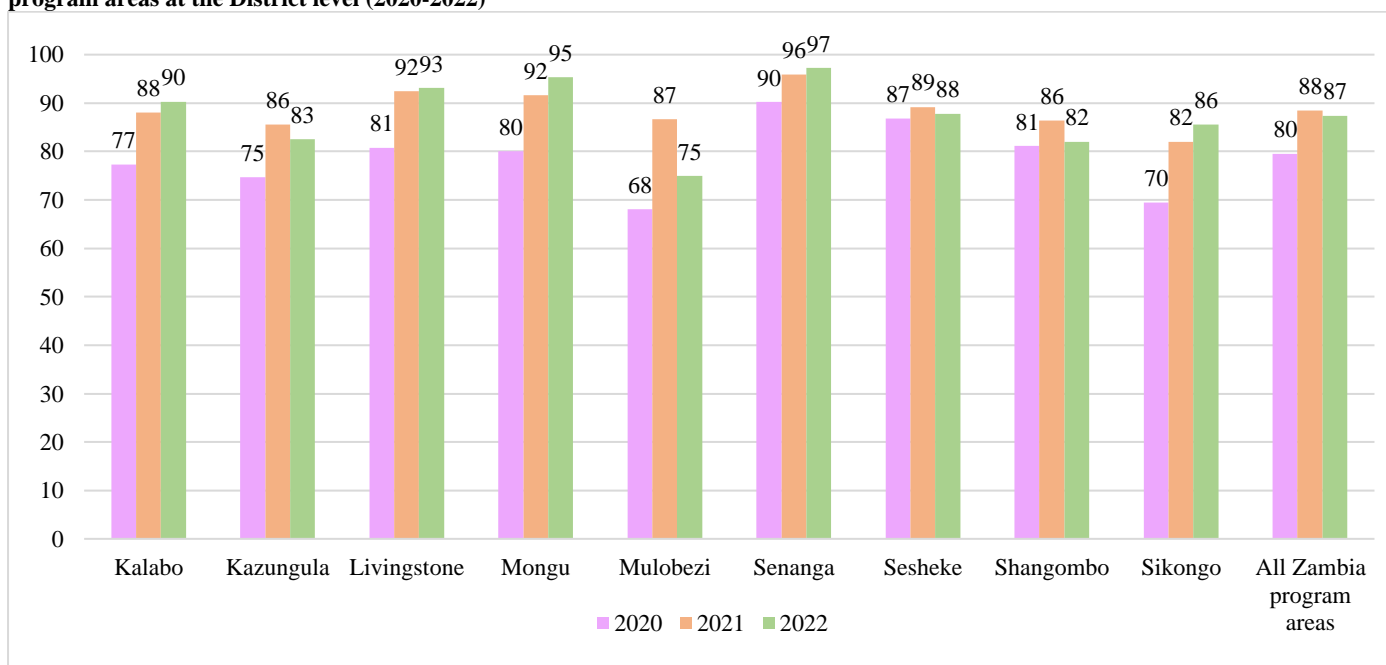


Figure 15. shows the proportion of respondents who identified the mosquito as the cause of malaria transmission and listed nothing else incorrect (e.g. getting soaked in the rain, eating unripe fruit, etc.). Across all Zambia program areas in 2022, there was no significant change to this indicator between 2021-2022 (88% in 2021 to 87% in 2022). Among program areas at the District level, results ranged from 75% in Mulobezi program areas to 97% in Senanga program areas. No significant change from 2021-2022 was observed among program areas the District level, except for among program areas in Mulobezi which showed a significant decrease from 87% in 2021 to 75% in 2022 ( $p = 0.022$ ).

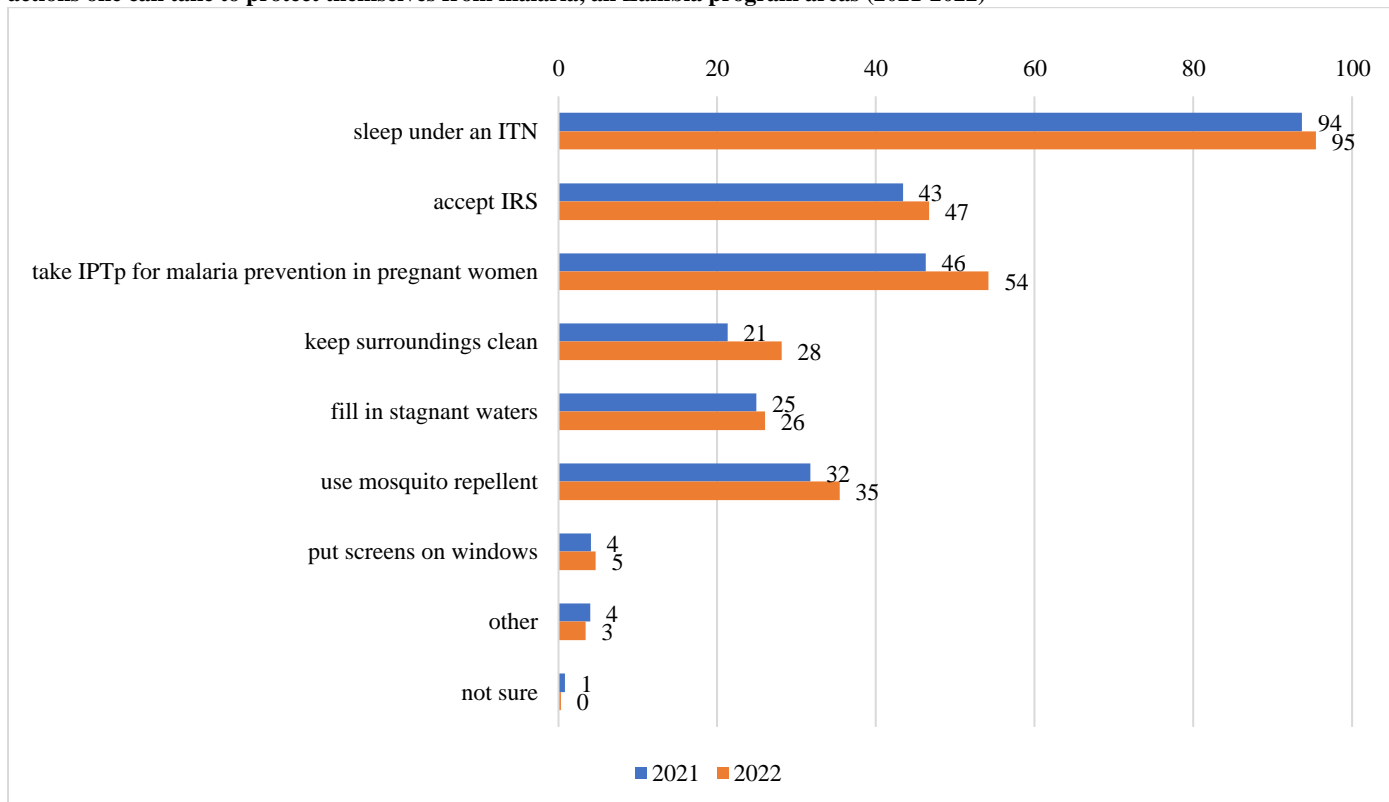
**Figure 15. Percent of respondents who identified the mosquito as the cause of malaria transmission, and listed nothing else incorrect, by program areas at the District level (2020-2022)**



To shed light on knowledge of malaria prevention, respondents were asked if there were things one could do to protect oneself from malaria (95% 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 16 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, 95% mentioned “sleep under ITNs”, 54% mentioned “IPTp for pregnant women”, and 47% mentioned “indoor residual spraying.” All of these responses increased in frequency compared to 2021.

**Figure 16. 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 Zambia program areas (2021-2022)**



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 12. shows these results from 2020-2022. Proportion of respondents who believed that these interventions help to prevent malaria a lot have increased each year from 2020-2022. Significant increases were observed in the proportion of respondents in 2022 who believed that ITNs ( $p=0.025$ ), IRS ( $p<0.001$ ), and IPTp ( $<0.001$ ) “helped a lot,” compared to 2021.

**Table 12. Percent of respondents that believe that ITNs, IRS, and IPTp “help a lot” to prevent malaria, all Zambia program areas (2020-2022)**

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

**Appendix 1. 2022 KAP survey sampling frame (IFCBMI Zambia program areas) and areas targeted for IRS within 12 months prior to the 2022 KAP Survey**

Province	District	Health facility catchment area (HFCA)	Neighborhood health committee (NHC)	Targeted to receive IRS within 12 months prior to 2022 KAP Survey		
Southern	Kazungula	Kazungula	Mwanga A	Yes (Jan 2022)		
			Mwanga B	Yes (Jan 2022)		
			Katoya	Yes (Jan 2022)		
			Kazala	Yes (Jan 2022)		
			Kazungula A	Yes (Jan 2022)		
			Kazungula B	Yes (Jan 2022)		
			Kapanda	Yes (Jan 2022)		
			Lumbo	Yes (Jan 2022)		
			Mwiya	Yes (Jan 2022)		
			Sikombwa	Yes (Jan 2022)		
			Sing'ombe	Yes (Jan 2022)		
			Mambova	Namapande A	Yes (Oct 2021)	
				Namapande B	Yes (Oct 2021)	
		Kazuni		Yes (Oct 2021)		
		Kapolota		Yes (Oct 2021)		
		Machenje		Yes (Oct 2021)		
		Ngweeze		Yes (Oct 2021)		
		Kabala		Yes (Oct 2021)		
		Livingstone	Libuyu	Zone A	Yes (Nov 2021)	
				Zone B	Yes (Nov 2021)	
	Zone C			Yes (Nov 2021)		
	Zone D			Yes (Nov 2021)		
	Nyanzabili			Yes (Nov 2021)		
	Chaba			Yes (Nov 2021)		
	Tusole			Yes (Nov 2021)		
	A			Yes (Nov 2021)		
	AB			Yes (Nov 2021)		
	Nkotuli			Yes (Nov 2021)		
	Nakatindi			Libes	Yes (Dec 2021)	
				Kashitu	Yes (Dec 2021)	
				Indeco	Yes (Dec 2021)	
		Nakatindi	Yes (Dec 2021)			
		Morelite	Yes (Dec 2021)			
Western	Kalabo	Kuuli	Kashenaba	No		
			Kuuli static	No		
			Liuwa	No		
			Lunde	No		
			Sibemi	No		
		Lukoko	Munde	No		
			Libunga	No		
			Sitoya	No		
			Mabula	No		
		Lumei	Samvu	No		
			Lumei Central	No		
			Masima	No		
		Mishulundu	Nakashinde	No		
			Kanyika	No		
			Maoma	No		
			Munyanya	No		
			Mutembo	No		
			Muyeye	No		
		Mulinga	Siliya	No		
			Kashimba	No		
			Liwina	No		
			Mulinga	No		
			Sikenge	No		
		Sishekano	Nan'ole	No		
			Simangu	No		
			Lwamutu	No		
			Mwabata	No		
			Silinji	No		
			Lushi	No		
		Mongu	Simulombe	Sishekanu	No	
				Ituku East	Yes (Nov/Dec 2021)	
				Ituku West	Yes (Nov/Dec 2021)	
				Kaongeta	Yes (Oct 2021)	
	Loongo			Yes (Oct 2021)		
	Miluwe			Yes (Nov/Dec 2021)		
	Mulumba			Yes (Nov/Dec 2021)		
	Simulima			Yes (Oct 2021)		
	Simulombe			Yes (Oct 2021)		
	Mulobezi			Mulobezi	Mulobezi Central	No
					Kashitu	No
					Nalwama	No
					Situmpa	No
					Lonze 1	No
		Kariba	Yes (Oct 2021)			
		Machile	Yes (Oct 2021)			
		Kasima Central	No			
		Inyambo	No			
Lonze 2		No				
NO	Mongu	Simulombe	Ituku East	Yes (Nov/Dec 2021)		
			Ituku West	Yes (Nov/Dec 2021)		
			Kaongeta	Yes (Oct 2021)		
			Loongo	Yes (Oct 2021)		
			Miluwe	Yes (Nov/Dec 2021)		
			Mulumba	Yes (Nov/Dec 2021)		
			Simulima	Yes (Oct 2021)		
			Simulombe	Yes (Oct 2021)		
			Mulobezi Central	No		
			Kashitu	No		
			Nalwama	No		
			Situmpa	No		
			Lonze 1	No		
			Kariba	Yes (Oct 2021)		
Machile	Yes (Oct 2021)					
Kasima Central	No					
Inyambo	No					
Lonze 2	No					

Province	District	Health facility catchment area (HFCA)	Neighborhood health committee (NHC)	Targeted to receive IRS within 12 months prior to 2022 KAP Survey				
Western	Senanga	Lui River	Tower	No				
			Lipuwe	Yes (Oct 2021)				
			Lui Mweemba	Yes (Oct 2021)				
			Liongo	Yes (Oct 2021)				
			Nalongo	Yes (Oct 2021)				
			Namuotndo	Yes (Oct 2021)				
			Sinanda	Yes (Oct 2021)				
	Sesheke	Mkusi	Mkusi	Mkusi Central	No			
				Mwanomai	No			
				Lusu	No			
				Maziba	No			
				Manyekanga	No			
		Mulimambango	Mulimambango	Mulimambango Central	Yes (Oct 2021)			
				Kasisi	Yes (Oct 2021)			
				Lilonga	Yes (Oct 2021)			
				Namatwi	Yes (Oct 2021)			
				Rice	Yes (Oct 2021)			
		Silumbu	Silumbu	Kapua	No			
				Nshwa	No			
				Kapeya	No			
				Lyomboko	No			
				Namikuta	No			
				Kaale	No			
				Nayanda	No			
				Silumbu Static	No			
		Zambezi	Zambezi	Zambezi Zone 1	Yes (Oct 2021)			
				Katongozone 2	Yes (Oct 2021)			
				Maondo Zone 3	Yes (Oct 2021)			
				Tahalima	Yes (Oct 2021)			
		Shangombo	Shangombo	Shangombo	Liyuwayuwa	Yes (Nov 2021)		
	Mboiwa				Yes (Nov 2021)			
	Katukule				Yes (Nov 2021)			
	Lihonge				Yes (Nov 2021)			
	Shalitata				Yes (Nov 2021)			
	Musa				Yes (Nov 2021)			
	Kambungu				Yes (Nov 2021)			
	Make				Yes (Nov 2021)			
	Shandambi				Yes (Nov 2021)			
	Likwangelui				Yes (Nov 2021)			
	Kasima				Yes (Nov 2021)			
	Namatanda				Yes (Nov 2021)			
	Shangombo Central				Yes (Nov 2021)			
	Sipuma				Sipuma	Sipuma	Lyamaya	Yes (Nov 2021)
			Lilonga	Yes (Nov 2021)				
			Sibuku	Yes (Nov 2021)				
			Sipuma Central	Yes (Nov 2021)				
			Shalimba	Yes (Nov 2021)				
			Manwi	Yes (Nov 2021)				
			Camp 8	Yes (Nov 2021)				
			Nombwe	Yes (Nov 2021)				
			Fuo	Yes (Nov 2021)				
			Sipuma West	Yes (Nov 2021)				
			Sikongo	Liundu			Liundu	Likala
Lounde								Yes (Nov/Dec 2021)
Sambao								Yes (Nov/Dec 2021)
Nesha	Yes (Nov/Dec 2021)							
Sikongo Central	Sikongo Central	Sikongo Central		Malondo	Yes (Nov/Dec 2021)			
				Muwelo A	Yes (Nov/Dec 2021)			
				Nene	Yes (Nov/Dec 2021)			
				Lyasimu	Yes (Nov/Dec 2021)			
				Sibuo	Yes (Nov/Dec 2021)			
				Luwe	Yes (Nov/Dec 2021)			
				Muweshi	Yes (Nov/Dec 2021)			
				Sishosho	Yes (Nov/Dec 2021)			
				Ngulumani	Yes (Nov/Dec 2021)			
				Utokota	Yes (Nov/Dec 2021)			
Muwelo B	Yes (Nov/Dec 2021)							
Situlu	Situlu	Situlu		Sipwechia	Yes (Nov/Dec 2021)			
			Kaenyi	Yes (Nov/Dec 2021)				
			Nomai	Yes (Nov/Dec 2021)				
			Lirolelo	Yes (Nov/Dec 2021)				
			N'anda	Yes (Nov/Dec 2021)				



## **Appendix 2. References**

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