
# Knowledge, Attitudes and Practice (KAP) survey of Long-Lasting Insecticide-treated bedNets (LLITNs) in the refugee camps of Kule, Tierkidi and Nguenyyiel, in Gambela, Ethiopia, MSF-OCA catchment area.

# Knowledge, Attitudes and Practice (KAP) survey of Long-Lasting Insecticide-treated bedNets (LLITNs) in the refugee camps of Kule, Tierkidi and Nguenyyiel, in Gambela, Ethiopia, MSF-OCA catchment area.

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## Survey proposal

***11th of June 2018***
***Version 2***
***Kate Doyle, MPH***

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|---|---|
| ***First version*** | ***14th May 2018*** |
| ***1. Revision*** | ***11 July 2018*** |
| ***2. Revision*** | |
| ***Survey design*** | KAP survey |
| ***Survey period*** | July-August 2018 |
| ***Survey site*** | Refugee camps of Kule, Tierkidi and Nguenyyiel in Gambela, Ethiopia, where MSF-OCA works |
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| ***Data collection and analysis by*** | MSF-*OCA* |
| ***Protocol and survey design*** | ***Kate Doyle, Isidro Carrion-Martin*** |
| ***Collaborating institutions*** | Agency for Refugee and Returnee Affairs (ARRA)<br>United Nations High Commission for Refugees (UNHCR) |

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| An. | Anopheles |
| ACT | Artemisinin Combination Therapy |
| ASAQ | Artesunate and Amodiaquine |
| ARRA | Agency for Refugee and Returnee affairs |
| CI | Confidence interval |
| KAP | Knowledge, Attitude and Practice |
| LLITN | Long-Lasting Insecticide-Treated bedNets |
| MoH | Ministry of Health |
| MSF | Médecins sans Frontières |
| MSF-OCA | Médecins sans Frontières – Operational Centre *Amsterdam* |
| Pl. | Plasmodium |
| UNHCR | United Nations High Commission for Refugees |
| WHO | World Health Organisation |

# 1 INTRODUCTION

## 1.1 CONTEXT

Ethiopia is a land locked country in east Africa, known for its deep culture and history as well as its struggle with disease outbreaks, drought, malnutrition and major refugee inflex's. According to UNDP Ethiopia is ranked at 174 in the human development index. Life expectancy at birth is 64.6 years, infant mortality rate is 41.4 (per 1,000 live births), under 5 mortality rate is 59.2 (per 1,000 live births) and deaths from Malaria are 106 (per 100, 000 people).

Historically, Gambella region and Itang woreda area are places of ethnic tension between original Agnuak population, Nuers who have arrived in earlier refugee movements 20+ years back, and new Nuer refugees, and Highlanders. All incomers to the area are not refugees, and movement to/from both sides of the South Sudanese border is frequent. Tribal clashes and single incidents take place often; of late the bigger fighting has been less frequent.

In Gambella region there are currently 6 camps and 5 reception centers. MSF activities are focused across 3 camps (Kule, Tierkidi and Nguenyyiel) and 1 reception center (Pamdong). While the current refuges crises has been present since early 2014, over the last 18 months more than 130,000 new arrivals have entered Ethiopia, leading to the creation of the latest camp, Nguenyyiel.

As of 31st March 2018, official UNHCR data indicates a total South Sudanese population in the region to be 419,259, which now exceeds the local/host population. Key demographics include; 55% of population to be female; 64% to be under 18 years of age; 88% to be women and children. Within this total there are 3,076 unaccompanied minors (0.73%) and 23,238 are separated children (5.5%).

It is assumed that also in 2018 the number of unregistered refugees will massively increase due to unwillingness for relocation to other regions creating the need for further extensions or new camps.

As all people staying in Gambella camps are not registered with UNHCR, many who seek help with MSF are not officially entitled to it. ARRA health Centres in Tierkidi and Nguenyyiel refuse to treat those without ration card/registration. In case of need of further referral to Gambella hospital, MSF are forced to compromise with the treatment, as those patients are not granted a permit.

Across the region, but specifically in the camps served by MSF, we see very high case load of malaria, with major spikes during the rainy season. In 2017, across Kule and Tierkidi camps, MSF treated more than 70,000 people for malaria. Prevention efforts in the camps have been very weak, with limited bed net distribution (last one in 2014) and poorly planned/ executed IRS campaigns (Oct 2017—late rain season).

MSF will now engage to take on a more active role in prevention and treatment mechanisms including mass bed net distribution, IRS campaigns, use of primaquine (decreased transmission); improved follow up of cases requiring re-treatment as well as participating in a study with the Ethiopian Public health institute looking into the presence of HRP2 gene deletion.

**Figure 1**. Ethiopia.


## 1.2 MSF PRESENCE IN THE COUNTRY

In Gambela region, MSF-OCA provides health services to South Sudanese refugees in three camps (Kule, Tierkidi, and Nguenyyiel). MSF Health activities began in Kule and Tierkidi camps in August 2014, though MSF was already present since March 2014 and was the lead for implementation of all water and sanitation needs. MSF has been present in Nguenyyiel camp since October 2017. As of May 2018, MSF-OCA operates three health posts and one health centre in Kule, three health posts and a 24-hour maternity in Tierkidi, and three health posts in Nguenyyiel. They also operate a mobile clinic at Pamdong transit centre, the location where refugees are registered and stay before transport to a camp, providing primary health care and ANC services.

The top morbidities from March 2018 are shown below for the Kule/Tierkidi project and the Nguenyyiel project.

**Table 1. Top five morbidities by age group and location, 2017.**

| Oupatient departments - Kule/Tierkidi | | | | | |
|---|---|---|---|---|---|
| **<5 years** | **No.** | **% of total in grp** | **≥5 years** | **No.** | **% of total in grp** |
| Confirmed malaria | 19,217 | 21% | Confirmed malaria | 53,016 | 25% |
| Acute lower respiratory tract infection (ALRTI) | 17,269 | 19% | Acute upper respiratory tract infection (AURTI) | 27,757 | 13% |
| Acute water diarrhea (AWD) | 16,933 | 19% | ALRTI | 22,342 | 10% |
| AURTI | 12,694 | 14% | Skin disease | 17,568 | 8% |
| Eye infection | 6,951 | 8% | Gastritis / dyspepsia | 15,045 | 7% |
| **Inpatient department – Kule/Tierkidi** | | | | | |
| LRTI | 442 | 43% | Severe malaria | 158 | 16% |
| Severe malaria | 198 | 19% | LRTI | 151 | 15% |
| AWD + dehydration | 88 | 9% | Other | 148 | 15% |
| Neonatal disease | 84 | 8% | Tuberculosis | 100 | 10% |
| Other | 64 | 6% | Chronic diseases | 94 | 9% |

**Figure 2a. Kule Camp map.**

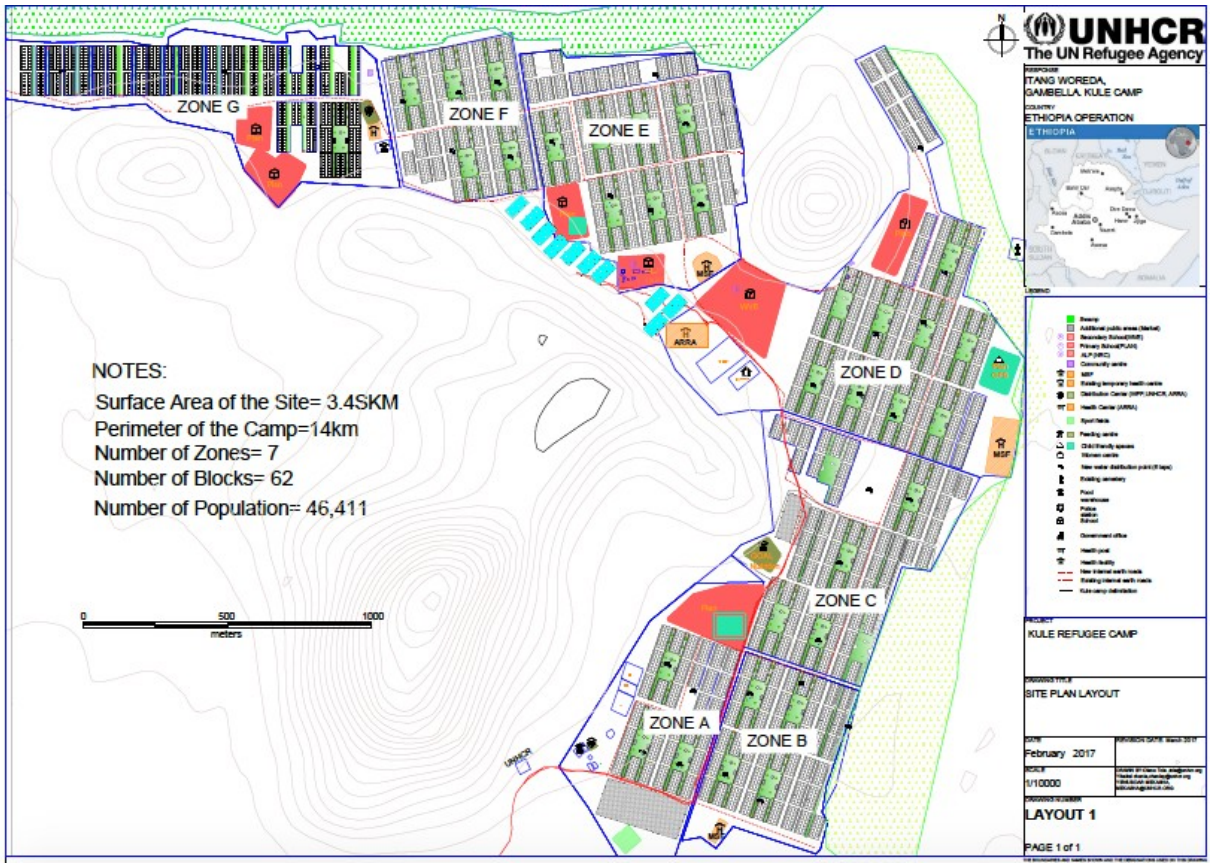


**Figure 2b. Tierkidi Camp map.**

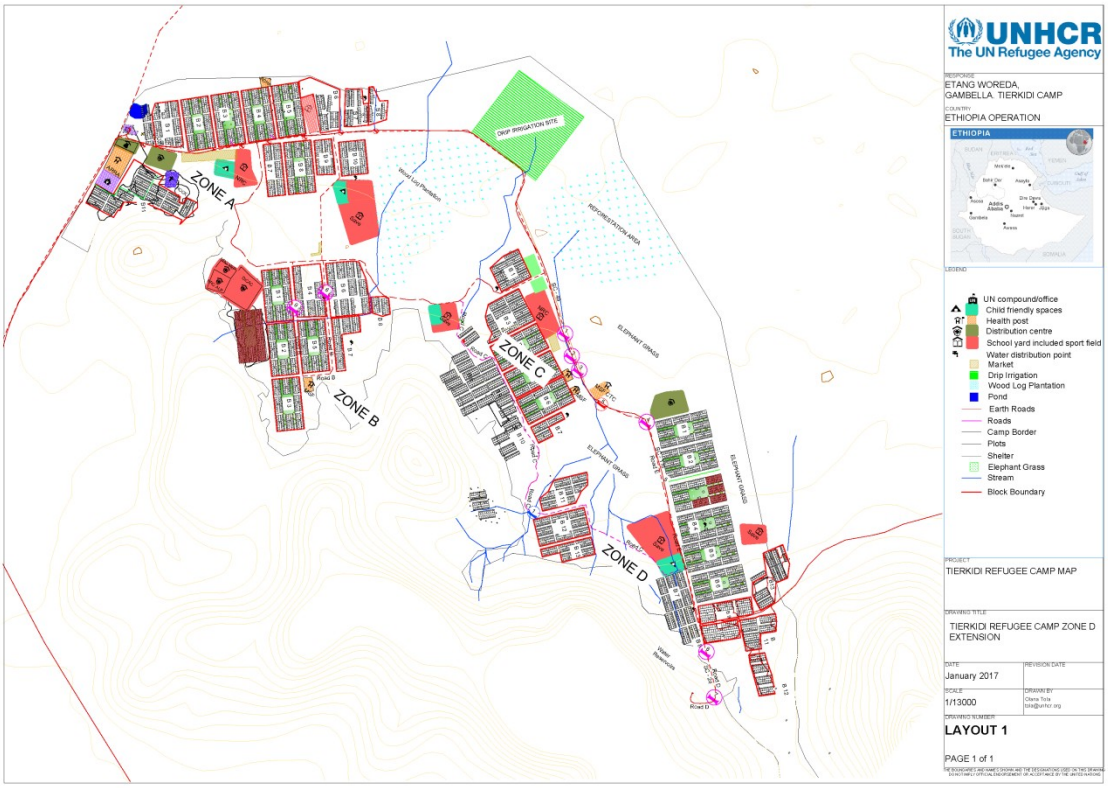
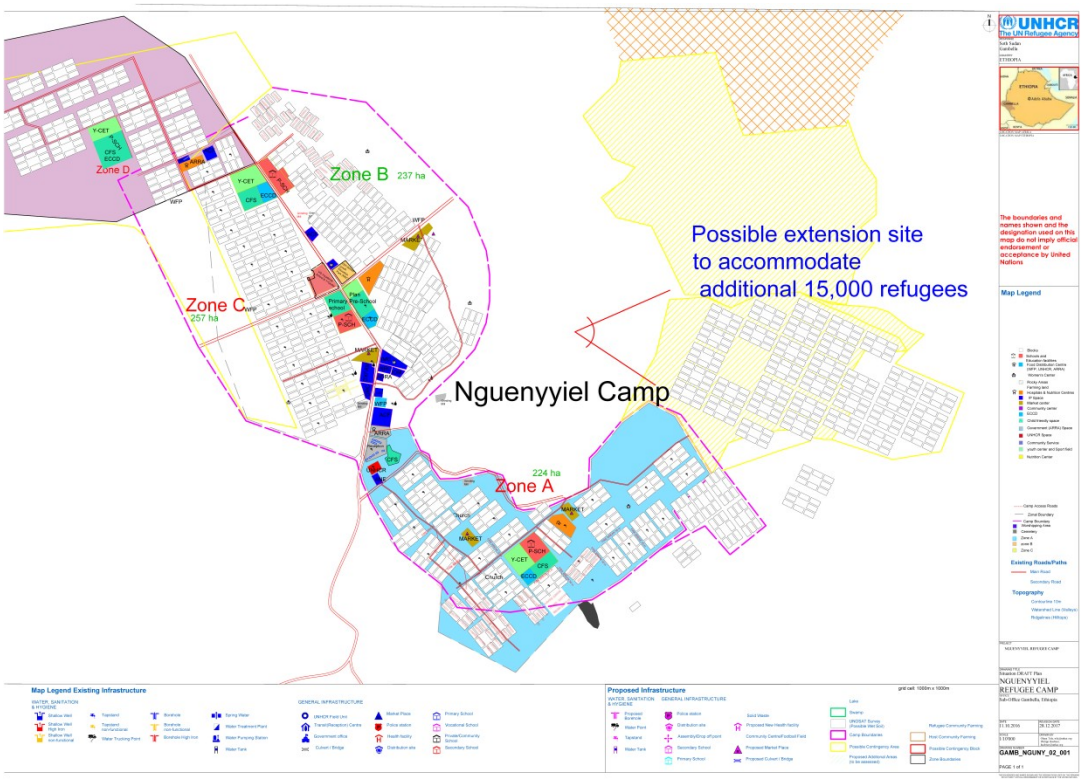



**Figure 2c. Nguenyyiel Camp map.**



## 1.3 BACKGROUND - JUSTIFICATION FOR THE SURVEY

Malaria represents a large portion of morbidities in Kule, Tierkidi, and Nguenyyiel. Malaria cases by month for Kule and Tierkidi from 2017 are shown in figures 3a (outpatient departments (OPDs)) and 3b (inpatient department (IPD)). While those above five years old had a greater proportion of confirmed malaria every month, the severe cases admitted to IPD were often disproportionately under-5s.

**Figure 3a. Confirmed malaria cases by age group and month, outpatient departments, Kule & Tierkidi, 2017.**

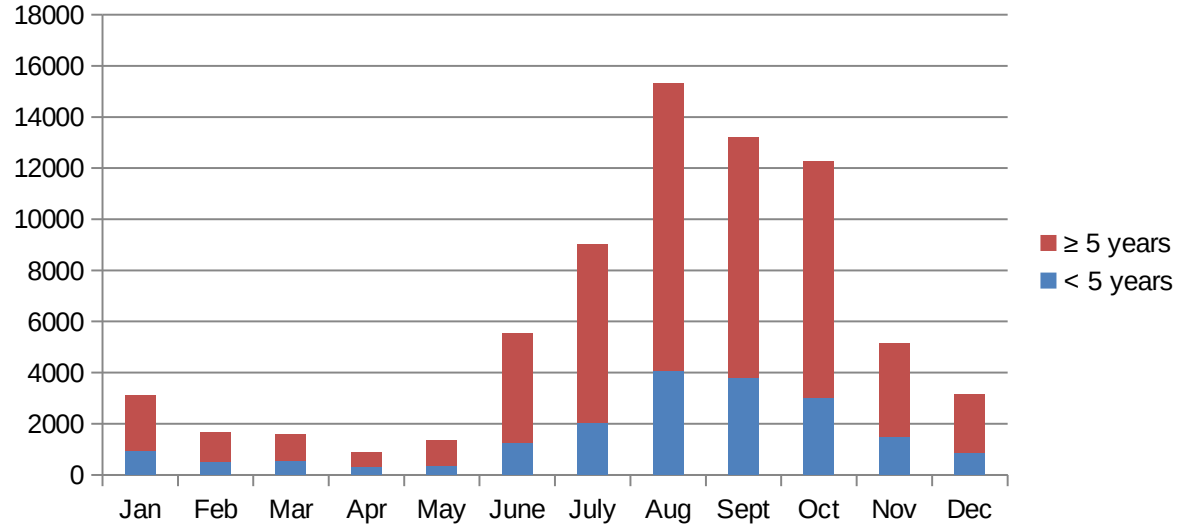
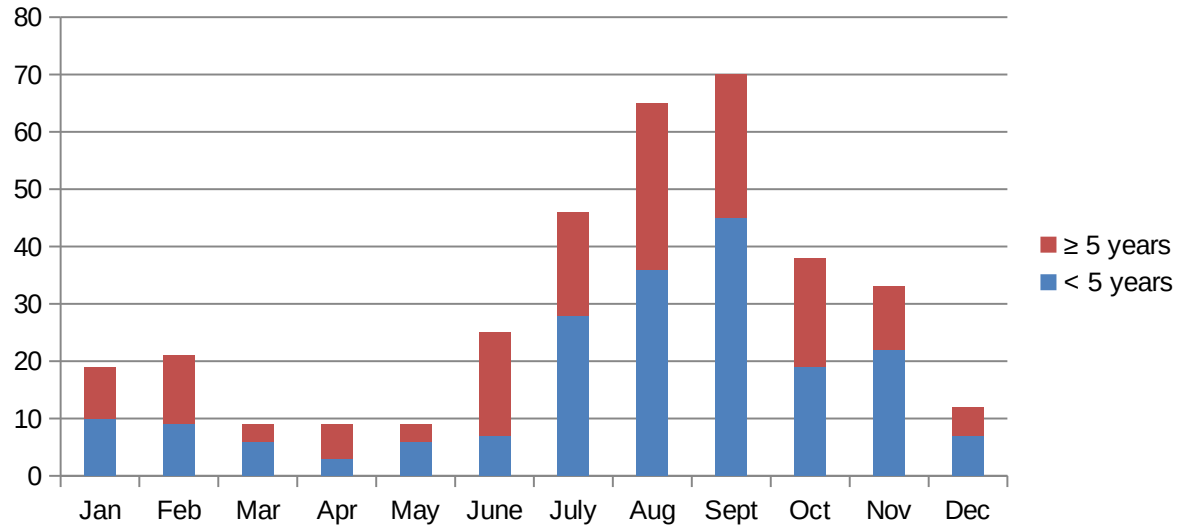



**Figure 3b. Severe malaria cases by age group and month, inpatient departments, Kule, 2017.**




LLITN coverage estimates from most recent SENS survey (May 2017) are shown in the Table 2. The standard for number of persons per LLITN should be 2 persons. The same survey was also conducted in four other regional camps; Nguenyyiel had the lowest percentage of ownership among all, and Tierkidi was below average.

**Table 2. LLITN coverage estimates, UNHCR SENS 2017, 3 camps.**

| Camp | Estimated proportion of households with at least one LLITN<br>Point estimate (95% confidence interval) | Average number of LLITNs per HH<br>Point estimate | Average number of persons per LLITN<br>Point estimate |
|---|---|---|---|
| Kule | 53.6% (46.6, 60.4) | 1.50 | 9.2 |
| Tierkidi | 34.4% (28.2, 40.9) | 1.50 | 13.1 |
| Nguenyyiel | 16.7% (12.5, 21.6) | 1.54 | 21.0 |

These estimates are below community estimates as compared to other regions of Ethiopia. Biadgilign found 62.4% in the community owned a net in eastern Ethiopia,[i] and Deressa found similar community coverage in Oromia and Amhara.[ii]

In 2018, UNHCR and ARRA have planned that all refugees in the three camps will receive LLITNs and IRS. MSF will conduct the distribution of LLITNs and the spraying in Kule camp, and ARRA will conduct the distribution and spraying in Tierkidi and Nguenyyiel. This survey should assess whether these campaigns have improved IRS and LLITN coverage, and will provide a more detailed understanding on LLITN usage, and malaria knowledge. There is a lack of data on coverage of these interventions, as well as knowledge and attitudes among this refugee population, which will be addressed in this survey.

The results of this survey will provide information on the success of the LLITN distributions and coverage of and attitudes towards IRS in each camp. This information will also enable the MSF-OCA projects to address gaps in malaria and treatment knowledge to better target malaria intervention and plan advocacy strategies.

# 2 OBJECTIVES

## 2.1 PRIMARY OBJECTIVES

- To estimate the Long-Lasting Insecticide-Treated bedNets (LLITN) coverage ratio for the total population in the MSF catchment area

## 2.2 SECONDARY OBJECTIVES

- To describe the population surveyed by sex and age
- To measure the LLITN coverage ratio for children under five years of age and pregnant women
- To estimate indoor residual spraying (IRS) coverage ratio for the total population in the MSF catchment area
- To assess malaria knowledge, attitude and practices in the population including recognition of symptoms, and how to prevent malaria with special focus on LLITN.
- To assess knowledge, attitude and practices about malaria treatment.

## 2.3 SURVEY DESIGN

Cross-sectional population-based survey using random spatial sampling to select participating HHs.

# 3 SURVEY AREA AND PERIOD

The survey area will be the three main refugee camps in the MSF-OCA catchment area of the MSF-OCA Gambela project: namely Kule, Tierkidi and Nguenyyiel refugee camps.

The period of study will be July and August 2018. July is the month with highest average of rain (https://en.climate-data.org/location/32015/), and August (2017/2016) and September (2015) are the months where we have seen the peak in malaria cases in the last 2 years in the MSF OCA OPDs.

# 4 SURVEY POPULATION

The survey population will consist of all people living in the camps of: Kule, Tierkidi and Nguenyyiel .

Information on current population estimates is based on a census carried by the MSF-OCA team in July 2017.

According to last data prepared by UNHCR camp population is: Kule (53,000); Tierkidi (72,000); and Nguenyyiel( 97,000)

### 4.1 INCLUSION AND EXCLUSION CRITERIA

A person will be included in the survey if s/he satisfies all of the following criteria:

- Member of the randomly selected household (see section 5.1. for the definition of a household)
- Adult ( ≥16 8 years)
- Informed consent has been given ~~the consenting adult who lives in the household~~( see section 9.1. for details on the informed consent form)

A person will be excluded from the survey if s/he satisfies either of the following criteria:

- Refuses to participate in the survey
- Not able to provide informed consent due to disability, illness, or intoxication

## 5 DEFINITIONS

### 5.1 HOUSEHOLD DEFINITIONS

*Definition of household*

A household will be defined as a group of people who slept under the same roof the previous evening. The whole household will be counted in the survey, no matter the age of the household member or the relation with the other members.

## 6 SAMPLE SIZE AND SAMPLING

### 6.1 SAMPLE SIZE

Sample size was calculated with the help of OpenEpi using the following equation:

$$n = (1 + R_{NR})(deff)\frac{z^2_{\alpha/2}\, p(1-p)}{d^2}$$

Where n is the target sample size including non-response, $R_{NR}$ is the estimated non-response rate, deff is design effect, z is the desired precision level, p is the expected proportion, and d is the acceptable margin of error.

The key survey outcome is LLIN coverage, which we conservatively estimated as 50%. In June 2017, the most recent SENS survey found the number of households that owned at least one LLIN ranging between 17—54% for these three camps.

We assumed random spatial sampling with a design effect of 1, and a non-response rate of 10% (in the census carried out by MSF in 2017 the non-response rate was 11% in Tierkidi and 4.7% in Kule). We set the desired precision level as 5% and the acceptable margin of error as 5%. With these parameters the sample size needed was estimated as ~~422~~ 423 per camp.

## 6.2 SAMPLING

We will generate 5287 random GPS points within the defined inhabited polygons of each camp. These 5287 points include 4232 for the sample size and 105 extra to account for areas of low population density, where a household cannot be located within 20m of the generated point. We chose 105 extra points for 3 points per team per day. The perimeter of the camp will be generated either using satellite imagery (where available, recent, and feasible), or on-the-ground by the field team using a GPS device. The random points will be generated using QGIS software. We consider that the density of population within these areas is uniform enough to allow this method. However, if a point does not have a household or shelter within 20m, it will be excluded during data collection. If two points fall within the same household, one point will be excluded.

Once all the GPS points are generated, the study coordinator will divide them into groups of 15, assuming that 12 will be the number of interviews that each team of interviewers will be able to perform each day with 3 replacements for low population density. Prior to daily data collection, the study coordinator will assign the GPS in each group a number indicating the order of interviews. The interview team will go to the assigned point using their GPS. Once at the point, one of the interviewers will face east using a compass application on their phone or tablet. The nearest household facing east will be interviewed. If there is any point with no household within 20m of distance, this point will be discarded and they will walk to the next one. Each team will visit 12 households per day. If the household selected is empty or refuses to participate, it will not be replaced. The team will move to the next point and consider the non-response household as one of their 12 interviews. Only points without a household within 20m will be removed from the sampling frame.

# 7 DATA COLLECTION

The Refugee Camp Committee (RCC) chairman and zonal leaders will be informed before data collection commences. They will be asked to inform block representatives.

In the households randomly selected according to the above methodology, the purpose of the survey will be explained to an adult member of the household (the head of household, as designated by UNHCR, when available) in ~~the language he or she is familiar with~~Nuer and verbal consent obtained to conduct the interviews. If they decline to participate, this will be accepted, written down and the next household approached; the number of household refusals and reasons will be included in the survey report.

The household interviews will be based on a KAP questionnaire that consists of the following sections:

- Age, sex and pregnancy status of all persons who met the definition of a household
- Malaria knowledge of these persons
- LLITN behaviour of these persons
- Attitude of these persons towards LLITNs
- Verification of which persons slept under each LLITN
- History of indoor residual spraying at the household
- Treatment knowledge, attitude and practices within the household

A questionnaire template is provided in the annex part of this document.

Interviewers will request to see all nets owned by the household. If nets are hanging, the interviewers will enter the home to inspect the nets. The interviewers will note the make of the net, whether the net has been modified through cutting or sewing, the location of the net (for example, in the packet, hanging inside, hanging outside, drying after being washed, and others), and the number of holes that are bigger than the diameter of a thumb or pen. To determine the number of holes, interviewers will open the net and spread it to examine for holes.

During the consent process, participants will be informed that interviewers will ask to see their nets. During the interview, interviewers will directly ask if they can look at the nets. As with all questions in this survey, participants are free to decline this series of questions.

## 8 DATA ENTRY AND ANALYSIS

Data will be directly entered into an electronic form using the Dharma platform. No unique identifiers will be collected. The GPS location used to identify the household will not be associated with the household form. All GPS location information will be erased once the data collection has finished. All databases will be automatically generated and all data will be anonymised and electronic files stored password-protected by MSF-OCA. Only study investigators will have access to these data files. At the end of each day supervisors will check the forms in the tablets to check for inconsistencies in data entry and responses; retraining will be provided as needed. Data cleaning, management and analysis will be conducted using STATA 14 (StataCorp, College Station, TX, USA) or R 3.4.4 (R Foundation). All data cleaning and management manipulation will be done with the cited statistical software. If changes are made manually, the analyst will produce a change log to guarantee the reproducibility of any analysis.

After the survey, the questionnaires and consent forms will be archived for at least 5 years in headquarters.

All indicators (i.e. sex and age of the survey population) will be calculated as proportions with 95% confidence intervals (95%CI). Where appropriate, differences in proportions by group will be measured using t-tests or, for categorical questions, Pearson $\chi 2$-tests; p-values (p) will be presented.

## 9 ETHICAL ISSUES

The survey will be conducted in accordance with the World Health Assembly of 1975 concerning ethical aspects in human tests, and with the Helsinki declaration[1].

The protocol and questionnaire are inspired in and similar to the study “Survey on Knowledge, Attitudes and Practice (KAP) survey of Long-Lasting Insecticide-treated bedNets (LLINs), in the Democratic Republic of Congo (DRC)”, carried out by OCA and ~~approved by the MSF Ethics Review Board in 2012~~ (final report available in https://remit.oca.msf.org/studies/147).

1 [http://www.wma.net] (accessed May 30, 2018)

The survey protocol will be submitted to the Ethics Review Board of MSF. It will also be shared with and review by ARRA who will advise of internal ethics procedures.

The Refugee Camp Committee chairman and zonal chairmen in each camp will be informed of the purpose of the survey. The field team will provide a short information sheet for their endorsement. The field team will also post this information sheet in trafficked areas of the camp, such as markets, and near MSF structures.

MSF-OCA commits to sharing survey results with everybody who has participated in the survey. Results will be returned to the local community through zonal meetings and posters that will be placed in the MSF structures.

The MSF medical responsible in the field will advise the data collection team on the referral practices when finding sick people in the survey areas as well as procedure regarding psychosocial issues or victims of violence.

## 9.1 VERBAL CONSENT FORM

A verbal consent will be sought from all ~~heads of households~~participants meeting the inclusion criteria ~~participating in~~for the survey. We will use only verbal consent in the same way that the yearly SENS is carried out by UNCHR every year.

Yes/no tick boxes will be added to the beginning of the Dharma questionnaire form regarding verbal consent and the data collector should mark whether consent was given, yes or no.

Additionally, an information sheet with consent information will be given to each household head and it should remain with her or him after conducting the interviews. The information sheet will be translated into Nuer.

All subjects included in the surveys will have the investigation explained to them in Nuer. Everyone will be offered the opportunity to refuse participation in the survey at any time without penalty and no incentives or inducements will be provided to any respondents. Everyone is completely free to participate or not.

## 9.2 RISKS AND BENEFITS OF THE SURVEY AND CONTINGENCY PLANS

The KAP survey does not cause any physical harm to participants. Nevertheless, asking to enter the home or compound of the household members may be upsetting, relatively intrusive and, in the camp context, there is limited privacy. This study will use local staff and provide careful training on interview techniques to mitigate this.

Households will not directly benefit from this survey, and incentives for participation will not be provided. However, participation will benefit the community in several ways. A better

understanding of LLITN coverage, malaria knowledge, (including malaria treatment) and LLITN behaviour in the area will allow better tailored programming and more efficient use of resources. Accurate data on LLITN coverage are of tremendous importance for advocacy on national and international level and information around malaria KAP is essential to orientate health promotion and community engagement activities. .

An external threat could be sudden changes in the MSF perception and acceptance by the refugee community in Gambela, which could translate in obstacles for our teams' work.

## 10 COLLABORATION

This survey will be carried out in collaboration between MSF-OCA and UNHCR/ARRA,

MSF-OCA is the survey sponsor and is responsible for the funding. It is in charge of the field part of the survey, the analysis and report writing. Permission for publication must be obtained from MSF-OCA and ARRA.

Survey results will belong to MSF-OCA and ARRA.

# 11 IMPLEMENTATION OF THE SURVEY IN THE FIELD

## 11.1 SELECTION AND TASKS OF THE DATA COLLECTION TEAMS

The task of the data collectors will be to collect the necessary data for the survey.
Each data collection team is composed of two data collectors. It is estimated that a data collection team can complete 12 household interviews per day. To finalise the field part in a reasonable time, we plan for six data collection teams of two people each, plus two data collection supervisors. (See also section 12.5.)

General selection criteria for all data collectors:

- Able to read and write in English and
- Fluent in Nuer, and
- Available for the ENTIRE time of the survey (training and interview days), and
- If necessary: willing and able to work on weekends and holidays during the survey time (see section 11.5. for a possible timeframe in the field), and
- Motivated to participate in the survey, and
- Not biased in expectations of the outcome of the survey (including engagement in LLITN distribution in Kule)
- Experience with interviews in difficult settings and survey populations would be an advantage

## 11.2 SUPERVISION

The principal investigator is the overall responsible for the final version of the protocol, overall quality of the survey and data analysis, and the final report

The principal investigator will ensure that the following tasks are performed:

- Preparation of all necessary documents (protocol, questionnaires, informed consent forms) for the survey
- Preparation of the field component of the survey (training of the data collection teams, logistics, materials) together with the MSF team in the field
- Follow-up of the field component of the survey
- Data entry
- Data analysis
- Report writing

## 11.3 MSF SUPPORT IN THE FIELD

- Administrative support for survey preparation at the field level and during the field part, including liaising with UNHCR/ARRA,
- Human resource support, including hiring and managing data collectors
- Logistic support for survey preparation at the field level and during the field part, such as organizing sufficient cars for the supervisors, and MSF ID (e. g. aprons, vests or arm bands) to the data collection teams, stationary, printing the consent forms.

## 11.4 TRAINING OF THE DATA COLLECTION TEAM AND PRE-TESTING OF THE QUESTIONNAIRES

Three days training will be given to all data collectors to familiarise them with the background of the survey, the questionnaires, the information sheet and the informed consent form. The training will be given in English by the principal investigator, with Nuer translation as needed. It will consist of an intensive review of the questionnaires and the information sheet including role-plays. As the interviews will be held in the national language, the principal investigator should ensure that all data collectors are using the same and correct wording for providing information to the households and for the interviews. To ensure this the questionnaire will be translated to Nuer and back translated to English (by a different person). Although the questionnaire used for data collection in the tablets will be in English the role plays will be done with the Nuer questionnaire.

The 3-day training will be finished with a pilot survey. The pilot survey allows for the testing and possible final adaptation of the questionnaires and informed consent to field conditions.

A 3-days training agenda template is provided in the annex part of this document. The survey area for the pilot survey will be easily accessible by all data collectors by foot. This will allow the principal investigator to supervise all data collection teams by visiting all teams at least once during the pilot.

## 11.5 TIMEFRAME IN THE FIELD

Usually the following number of days is needed for the field part of the survey:

- 4 days to finalise the mapping of the camps right before the implementation of the survey we obtain the most up to date sampling frame
- 1-2 days for final preparation of the survey in the field, such as defining the final survey area, to finalise the sampling, to discuss the start of the recall period with experienced people who know the local context, to plan the survey days, to plan vehicle movements, to check materials for the survey, to organise photocopies of questionnaires and further required information, to define working conditions of the selected data collectors, such as working hours, per-diem (which usually should cover food and water during the time in the villages), payment
- 3 days training including the pilot survey (a 3-days training agenda template is provided in the annex part of this document)
- We expect that 1 team will be able to finish 1 cluster of 12 households in 1 day. Considering we have to interview 42~~32~~ households per camp, and we will work with six teams, this would make 18 days of interviews.

See Table 1 for a preliminary plan of the field part of the survey.

**Table 1: Preliminary plan of the field part of the KAP survey, MSF-OCA Gambela Region, Ethiopia 2018.**

| Nr. of days | To do |
|---|---|
| 4 | Camp mapping |
| 2 | Final preparation of the survey |
| 3 | Training including the pilot survey |
| 18 | Field part |
| 2 | Buffer days / debriefing |
| 0 | Travel days to return (project field epidemiologist is main investigator and field coordinator) |
| Total: 28 days | |

# 12 LOGISTICS

## 12.1 SUPPLIES NEEDED

Supplies to conduct the survey will be purchased via the Kule office.

The tablets for the survey will be brought in the country via XXXX

See Table 2 for a list of required supplies.

KAP questionnaires and informed consent forms will be developed by the principal investigator. Photocopies of all necessary documents will be done at the Kule office.

**Table 2:Supplies needed for the field part of the KAP survey, MSF-OCA Gambela Region, Ethiopia 2018.**

| Item | No. needed per team | No. needed for *1* team |
|---|---|---|
| Back pack/shoulder bag | 1 | |
| Clipboard | 2 | |
| Pencil | 3 | |
| Rubber | 2 | |
| Sharpener | 2 | |
| Aprons, vests, arm bands or similar with MSF identification / logo | 2 | |
| Plastic folder (for protection of questionnaires against rain and dust) | 3 | |
| GPS receivers | 1 | |
| Tablet | 1 | |

## 12.2 TRANSPORT NEEDED

Transport will be planned once the random points have been selected. Transportation will use cars available to the Kule and Tierkidi/Nguenyyiel projects.

[i] Biadgilign S, Reda A, Kedir H. Determinants of Ownership and Utilization of Insecticide-Treated Bed Nets for Malaria Control in Eastern Ethiopia. 2012. J Trop Med;2012:23505. Accessed at https://www.hindawi.com/journals/jtm/2012/235015/.

[ii] Deressa W, Fentie G, Girm S ,Reithinger R. 2011. Ownership and use of insecticide-treated nets in Oromia and Amhara Regional States of Ethiopia two years after a nationwide campaign. *Trop Med and Intnatl H.* 2011:16(12):1552-1561. Accessed at https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1365-3156.2011.02875.x.