

Evaluation of School Net Pilot Project in the Southern zone

Draft Report

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Executive summary

The School-based Net Programme (SNP), issued LLINs to school children in Mtwara Urban and Nachingwea districts in the first week of July 2013. A rapid household survey was conducted in August 2013 as a partial evaluation of the programme. The survey covered two districts, Mtwara Urban and Nachingwea in the Southern zone where the programme was implemented and two districts in the Lake zone, Sengerema and Chato were included for comparison.

The surveys addressed the following objectives:

- To estimate coverage of LLINs at individual and household level after implementation of the school net programme
- To estimate proportions of eligible school children who received the net
- To estimate percentage of the issued nets that reached the target households¹
- To estimate percentage of LLINs covered by the SNP
- To estimate the number of LLINs needed to cover the sleeping spaces
- To assess use of the net secured from the school-based net programme
- To estimate proportion of households that are not eligible for the school nets
- To identify characteristics of the households that are not eligible for the school nets
- To explore stakeholders' perceptions and experience of delivering LLINs through schools
- To explore community perception of the SNP

A total of 596 and 591 households were surveyed in the Lake and Southern zones respectively.

School Net Programme

Evaluation of the programme was assessed from the household perspective since the LLINs issued to the school children were to be delivered to the households. To achieve that goal, messages about the programme had been delivered to the community members in various ways. Heads of the surveyed households were asked whether they had heard about the programme and stated sources of that information. In Mtwara Urban 94% had heard about the programme and 79% in Nachingwea district. School children, radio and friends/neighbours were cited as the main sources of that information. Information delivered to the school children about to whom the issued net belonged appeared to have been deliberately communicated differently to the household by those children, more than 86% of them stated that the net was his/hers.

Of the 591 **surveyed households** in Southern zone, (37%) were eligible for the School Net Programme. Of those, 81% received a net from the programme. Various circumstances accounted for the 19% that missed the LLINs– some school children received the nets but took them to another household, some did not receive the net for varied reasons, some were in boarding schools and some did not attend school on the issuing days. A total of 282 school children were eligible for the SNP, but information from parents/guardians was available for 276 **school children**, of whom 84% received LLIN from the school. Restricting the estimates to only those who were reported to have attended school on the issuing days,

¹ This measures whether the child brought the net home even if it was then sent to another household for any reason

94.4% received the LLINs, 93% in Mtwara Urban and 97% in Nachingwea district. Excluding boarding schools, a total of 223 (98.7) of the received LLINs were taken to the child's household.

Defining eligibility as a household with at least one child in primary or secondary school, 63% and 54% of the households would be eligible in the Lake and Southern zone, respectively. The national estimate is 62% households.

Ownership of Nets at household level

At the time of the survey 84% and 80% of household in the Lake (Chato and Sengerema) and Southern (Mtwara Urban and Nachingwea) zones respectively, owned at least one LLIN. In 2011, soon after implementation of the Universal Catch Up campaign, in both zones, 94% of the households owned at least one LLIN. Considering that it was three years after mass distribution of LLINs (UCC) this ownership indicator suggests that retention rate of the distributed LLINs was fairly high. Estimates for household ownership of *at least one LLIN per two people* were 23% in the Lake zone, and 49% in the Southern zone where SNP was piloted. Excluding the LLIN from SNP, that indicator was 40% in the Southern zone and in 2011 it was 49% and 78% in the Lake and Southern zone, respectively. Universal Coverage Campaign remained the main source of nets in both zones. In the Southern zone, the SNP contributed 22% of all owned LLINs.

Use of LLINs

Coverage of LLIN at individual level, as measured by sleep under LLIN in the previous night was very low in all age groups compared to the levels achieved in 2011.

While 67% of people in the surveyed households in the Lake zone slept under LLIN in 2011, only 38% of the people slept under LLIN in 2013. In Southern zone, LLIN use among the household members was 75% in 2011 and 47% in 2013. **Use of LLIN in households where there was at least one LLIN per two people was much higher in both zones (65% in the Lake zone and 69% in Southern zone).** Low use of LLINs is both a result of low ownership and behavioural.

Use of SNP net

The survey in the Southern zone, happened after about 4 weeks from the dates of issuing the LLINs. Only 89 (41%) of those nets that were in the household were used in the previous night. Most of the nets had not been hanged (75%) and non use due to perception that there were no mosquitoes (15%). School children who received the LLIN were the majority of those who slept under the net (by themselves) in the previous night (58%). Sharing the LLIN with other members of the household or letting it be used entirely by others was substantially high, 42%.

Some of the children who received LLIN from SNP slept under another net while others did not use any net. Fifty one percent of School children who received LLIN from SNP slept under LLIN in the previous night and 37% of those who were in school but did not receive LLIN slept under LLIN.

Households that had sufficient number of nets had a higher proportion of nets that had not been hanged (65.1%) compared to those households where the number of nets were less than the number of sleeping spaces, about 47% of the nets had not been hanged by the time of the survey.

Sleeping spaces covered by LLIN

Proportions of sleeping spaces covered by LLIN were derived from the number of LLINs against the number of sleeping spaces. In the Lake zone, a total of 1707 sleeping spaces were reported and LLINs in the households at the time of the survey were 1108. As such, households had LLINs enough to cover about 65% of the sleeping spaces, thus up to 35% were not covered by an LLIN. In the Southern zone, where the school net programme was piloted had a total of 1051 LLINs and 1544 sleeping spaces, thus the LLINs in those households would be enough to cover 68% of the sleeping spaces.

Comments

- Programmes can deliver LLINs to the households. Use is entirely determined by the recipient of the net. The intensive Behavioural Change Campaigns have potentially improved understanding of the need for using a net throughout the year. However, behavior has a substantial contribution to the observed low use of LLINs. The survey was conducted during dry season (August 2013) when mosquito densities are relatively low and thus low perceived need for using a net. This perception was evidenced in the high frequency of “*no mosquitoes*” as a reason for non-use of nets.
- In Chato district, IRS had been implemented just few months prior to the survey reported here

Introduction

With financial support from various multilateral and bilateral donors, Tanzania continues to fight against malaria by implementing a four-pronged strategy. Among the interventions in that strategy are Insecticide Treated Nets (ITNs) as a proven efficacious and cost-effective tool for malaria control (Gamble et al 2006). While the Tanzania National Voucher Scheme (TNVS) that delivers discounted LLINs to pregnant women and infants by use of a voucher is ongoing, mass distribution of long-lasting insecticidal treated nets (LLINs) was successfully implemented in the whole country between 2010 and 2011.

The mass distribution of Long Lasting insecticidal Nets (LLINs) in Tanzania translated into remarkably high coverage both for ownership and use (Nathan & Sedekia 2011, West *et al* 2012, TACAIDS *et al* 2012). Sustaining those coverage levels is critical to achieving the desired malaria control targets. Stakeholders are well aware that over time, coverage will inevitably go down due to attrition of the distributed LLINs. While some undesirable practices that contribute to attrition can be contained or minimised through various strategies, the LLINs will however, eventually wear out physically and the efficacy of the insecticide consistently diminishes over time. Household dynamics, including new births and setting up new sleeping spaces is another source of a household net gap.

For the purpose of maintaining LLIN coverage gains, the Tanzania National Malaria Control Programme (NMCP) in collaboration with the Swiss Tropical and Public Health Institute (Swiss TPH) expertly explored potential delivery models for the keep-up strategy for Tanzania through consultation with stakeholders and modeling various options (Koenker *et al* 2011). Based on the results of that consultancy and considering feasibility aspects, two complementary strategies have been proposed. The first keep-up strategy is the ongoing Tanzania National Voucher Scheme (TNVS) that targets pregnant women and infants. The second proposed strategy is a school-based net distribution. This approach uses school children as vehicles to deliver LLINs to the households. The School-based Net Distribution Programme (SNP) has been piloted in the Southern zone (Lindi, Mtwara and Ruvuma Regions) by the Ministry of Health and Social Welfare in partnership with the Ministry of Education and Vocational Training. That approach is “new”, piloting would provide an opportunity to answer various fundamental questions that are critical to designing and implementing such a strategy at scale. The central goal of the evaluation of the SNP pilot is to answer the question “Do the nets issued to the school children reach the majority of households and contribute to maintaining the coverage achieved through the earlier mass distribution”?

Considering the time lapse² between the mass distribution of LLINs and the piloting of the school-based net distribution as a “keep up” strategy, this evaluation also provides important information about LLIN coverage after three years since mass distribution. However, assessment of the current status (physical integrity) of those nets (from mass distribution) is not part of this evaluation.

² Mass distribution of LLINs in the Southern zone was implemented in April 2009 while distribution to school children was done in June/July 2013.

Objectives

General objective: To evaluate the School- based Net Distribution Programme within selected districts of the piloted regions

Specific Objectives

- To estimate coverage of LLINs at individual and household level after implementation of the school net programme
- To estimate proportions of eligible school children who received the net
- To estimate percentage of the issued nets that reached the target households³
- To estimate percentage of LLINs covered by the SNP
- To estimate the number of LLINs needed to cover the sleeping spaces
- To assess use of the net secured from the school-based net programme
- To estimate proportion of households that are not eligible for the school nets
- To identify characteristics of the households that are not eligible for the school nets
- To explore stakeholders' perceptions and experience of issuing/delivering LLINs through schools
- To explore community perception of the SNP

Methods

The study involved a cross-sectional household survey and qualitative investigations. A structured questionnaire was used to gather data from the household respondents while interview guides were used for in-depth interviews and Focus Group Discussions (FGDs).

Study area

The School Net Programme was piloted in 3 regions in the Southern zone (Mtwara, Lindi and Ruvuma). Evaluation of the programme was carried out in two purposively selected districts, Nachingwea and Mtwara Urban. Those two districts were selected because they had available the baseline ITN coverage information, – they were among those included in the evaluation of the Universal Coverage Campaign (UCC) in 2011. Two districts, Sengerema and Chato served as control, they were chosen from the Lake zone among those included in the UCC evaluation.

Children targeted to receive LLINs for the households were those currently in primary school in Class 1,3,5 or 7 and secondary school students in Form 2 (second year of secondary education) or Form 4 (fourth year of secondary education).

Design

Quantitative and qualitative methods were applied. While the coverage estimates were derived from the household survey, perceptions and experiences of stakeholders in the School Net Programme were explored through qualitative methods.

³ This measures whether the child brought the net home even if it was then sent to another household for any reason

A cross sectional household survey was conducted in a representative sample of households in each of the three districts (sampling and sample size is described below). Sengerema and Chato districts were used as control to understand what would have been the coverage (ownership⁴ and use) of LLINs in the absence of the School Net Programme. Selection of the comparison districts based on two main criteria: i) distribution of the UCC nets in the Lake zone followed immediately after the Southern zone (Time difference is minimal). ii) Sengerema and Chato were included in the evaluation of the UCC.

Household survey

A structured questionnaire was used for interviewing the heads of households. The questionnaire has three modules: household module, school child module (not applicable to the Lake zone), and children under five years module. The respondent for the household and school child modules was the head of household or appropriate proxy in situations where the household head was absent or could not participate in the interview for any other reason. The children (<5 years) module aims at assessing their care givers exposure to Behavioural Change Communication (BCC) messages and self-efficacy in protecting their children against malaria.

Children eligible for the School Net Programme were identified in the household composition section and validated before proceeding to the specific questions about each eligible child. **From the design of the programme all school children will receive LLINs for their households over a two year period.**

In situations where the head of household was not available for interview, a proxy respondent was identified by the interviewer using this criteria **(the wife/husband or any other eligible person, should be an adult household member who has been around for at least three months, spent the previous night in the household, is willing to be interviewed and can adequately respond to the household questionnaire).**

Data were collected using PDAs

Sampling and sample size

The School Net Programme targeted children in specific grades/classes as a vehicle to deliver nets into households. Thus, only households with eligible children would receive the nets. However, sampling included all households in order to be able to establish the proportion of households that were not eligible for the School Net Programme.

The sample size was calculated with an assumption that LLIN use among all household members was 80%, an average household size of 5, and a design effect of 2⁵. The number of households per district required to estimate net use (among all household members) with a standard error of 2.5 is 102 per district. However, to optimize comparability of coverage indicators across surveys, the number of households covered per district in the previous surveys was maintained. Thus, 300 households were visited in each district. A multi-stage cluster random sample was applied. Districts were purposively

⁴ At least one LLIN and for every 2 people in the HH

⁵ This corrects for an increase in sampling variability in cluster sampling

selected. This was followed by selecting 10 clusters of 30 households each from each district. The sampling scheme meant that all households within the chosen districts had an equal chance of being included in the sample. Firstly, clusters (wards) were selected with probability proportional to the size of the ward. Within each chosen ward, one sub-village (kitongoji) was selected using simple random sampling. Within each selected kitongoji, 30 households were chosen using a modified EPI-type sampling procedure.

Qualitative

In order to capture perceptions and experience of those involved in the programme at various levels in the districts qualitative methods were employed. These included In-depth interviews with District and Ward Education officers, secondary and primary school teachers, malaria focal persons who participated explicitly in the programme and District Medical Officer who oversees all health related activities in the district. District commissioners were interviewed with understanding that by virtue of their positions, they would be informed about the programme. Furthermore, Focus Group Discussions (FGDs) were conducted with men and women in the community.

Sampling and sample size for the qualitative component

Specific eligible participants for In-depth interviews were predetermined guided by School Net programme implementation design. A total of 21 individual In-depth Interviews were conducted in Mtwara Urban and Nachingwea districts. In each of the two districts, a total of four FGDs were conducted with men and women including parents who had children eligible for the SNP. For each district, two of those groups were from communities within the centre of the village (one FGD for men and one for women) the other two groups were selected from communities in relatively remote settings. Selection of participants for FGDs was facilitated with a support of village leaders.

School registers

As a way of validating the information from households about LLINs issued to the children, schools were visited to access registers used for issuing the LLINs.

In the questionnaire a slot was provided for to indicate whether a specific child was issued a net according to the school register. In cases where the school register indicated that the child was given a net but at the household it was reported that the child was not given the net, then this was categorized as either misreporting (in the household) or potential leakage through the child or the issuing person. Although at planning level seeking clarification in discordant cases was considered, logistically that became hard to implement.

Quality control

To ensure quality of data, several measures were implemented at all stages of the survey starting from recruitment.

The field team was recruited from the pool of experienced interviewers and supervisors who had participated in the NATNETS M&E surveys for several years and intensive training was conducted. Randomly selected households had repeated interviews by the supervisor for few key questions.

Training and piloting

Training of the household and qualitative investigation field teams was conducted separately.

Household survey team spent 14 days in training and piloting of the survey tool. Training was done in Mtwara urban, piloting was conducted in wards that were not included in the sample of the actual survey. Training included description of the programme (Objectives, design etc.), purposes of the survey, seeking consent and interview techniques. The survey tool was revised after the training and piloting- revision was mainly on the skip patterns, wording of some questions and duration of the interview. Equally important, testing the questionnaire in the real setting picked up aspects that informed revision and fine tuning of the PDA programme. Piloting was

Qualitative team participated in the first few days of the household survey team training for the purpose of understating the programme (SNP), design and purpose of the survey. They then had their own training by a senior sociologist for a few days before they proceeded to setting appointments for Indepth interviews with the predetermined stakeholders.

Field supervision

Besides ensuring completeness of the field work, the supervisors accompanied interviewers in some randomly selected households and performed independent re-interviews for predetermined key questions.

Checking and storing data

Procedures similar to those used in the previous NATNETS household surveys were employed. At the end of each day, supervisors synchronized the PDAs to their Laptop computers and performed sets of checks using purpose-written MS Access programmes. The quality control checks compared the original interview and re-interview to identify discrepancies. The reporting programme produced summaries of the data collected for each cluster, including specific problems. Interviewers completed data error forms whenever a data entry error was encountered. Daily, those forms were collected by the supervisors and submitted to the data manager for data cleaning.

Qualitative data storage and quality control

With the consent of the respondents, interviews/discussions were digitally recorded and later on transcribed into word documents. The recorded interviews (audio) were synchronized to the team Laptop computers.

Data processing

Data management followed procedures similar to those used for the previous NATNETS national and sub-national level household surveys. All survey data were entered into handheld computers at the point of data collection. The data manager cleaned data using information from the data error forms, supervisor summary forms, daily Access-generated reports and standard range and consistency checks.

Informed consent

Heads of households were informed in advance about the purpose of the survey. This was done by providing them with an information sheet that briefly explained the national efforts to control malaria through mass distribution of LLINs, TNVS and the piloted programme. The purpose of the survey was also included in that information sheet. A copy of the information sheets were left with each household at the time of sampling households. Signed consent of each respondent was obtained before proceeding with interview.

Data analysis

Household survey

Data was analyzed using STATA software according to an analytical plan. The “svy” commands were used to allow the confidence intervals of estimated parameters to be adjusted for the cluster structure of the survey. In order to examine the relationship between LLIN coverage indicators and household wealth quintiles, principal components analysis was used to construct a household wealth index based on household asset ownership.

Qualitative data

Thematic analysis approach was used for the qualitative data.

Definition

For the purposes of evaluating the pilot, in this report eligible household for a LLIN from the school-based programme refer to those who had at least one child in primary class 1,3,5,7 or secondary school in forms 2 or 4. However, all households with at least one school child will be reached over a two year period.

Results

Indicators of LLIN ownership and use are included and where useful are compared to the 2011 results. Summaries for the School Net Programme are presented. Considering that the piloted “keep up” strategy as well as the ongoing TNVS both target specific subgroups¹ within populations, the first part of the results include categories of households by composition of its members. This approach will provide an insight into the characteristics of the households that will not be reached by any of the two strategies.

Basic household characteristics

Table 1 is a summary of the basic characteristics of the surveyed households. An outstanding contrast between the households in the Lake zone and the Southern zone is the size. While the mean household size in the Lake zone was about 7 people, households in the Southern zone had a mean of 4 people. This is also reflected in the proportion of households that were eligible for LLIN from the SNP, 52% and 37% in the Lake and Southern zone respectively.

Table 1: Summary of the surveyed households

	Southern zone	Lake zone
Number of districts	2	2
Number of clusters	20	20
Number of households	591	596
Number of people in the households	2415	4075
Number of people who slept in the HH in the night preceding the survey	2234	3770
Mean household size	4.1	6.8
Number of children under fifteen years	937	2089
Number of children currently in primary or secondary school	515	965
Number of children eligible for SNP	282	554
Number of currently pregnant women	45	94
Household has at least one child eligible for LLIN from the SNP	220 (37.2%)	309 (51.8%)

Understanding the characteristics of households that had a primary or secondary school child compared to the households in the general population is fundamental in informing strategies for reaching such households. Table 2 presents summary indicators of general households and those with no child in primary or secondary school currently, where available national estimates are included for comparison. Households that will potentially be reached with at least one LLIN from SNP are 63% and 54% in the Lake and Southern zone respectively. For both zones, the estimate for the general population, compared closely with the national estimate of 62%. Up to 15% of households in the Lake zone and 8% in the Southern zone could receive a LLIN for pregnant women from TNVS, the national estimate for that indicator is 6%. The households that had neither a child in primary nor in secondary school were more likely to have all members older than 50 years. Such households had also a higher proportion of single person households. More clarification is presented in Figures 1a and 1b.

Table 2: Household composition –general and the non-eligible (can we consider doing

Household characteristics	Lake zone		Southern zone		National (model)
	All N=596 (%)	Has no child in primary nor secondary school N=220 (%)	All N=591 (%)	Has no child in primary nor secondary school N=272 (%)	All (%)
Has a child under-five	70	66	46	43	56
Has a child <15 years	88	71	79	59	65
Has a student (primary or secondary)	63	-	54		62
Has a woman 15-49	87	82	81	73	-
Has a pregnant woman	15	15	8	7	6.3
Has a child <15 or a currently pregnant woman	90	76	80	62	85
Has all household members >50 years	2.5	7	5.2	11	-
Has only one person	2.7	7	4.1	9	7.6

Households that had a child under fifteen or a currently pregnant woman could be reached by either or both of the two keep-up strategies as follows:

- i) A household has a pregnant woman, an infant and a school child – LLINs from both TNVS and SNP

- ii) A household has a child in school and a pregnant woman, no infant– LLINs from both TNVS and SNP
- ii) A household has a child in school, an infant but no pregnant woman –LLINs from both TNVS and SNP
- iv) A household has no school child, no pregnant woman but an infant – LLIN for an infant from TNVS
- v) A household has no child in school, no infant but has a pregnant woman – LLIN for a pregnant woman from TNVS
- vi) A household has no pregnant woman, no infant but at least one child in school –LLIN from SNP
- vii) A household has no school child, neither a pregnant woman nor an infant –Not reached by any of the two keep-up strategies

Potential coverage for the two zones by the two keep-up strategies is presented in Venn diagrams, Figure 1a and Figure 1b. The diagrams show for each of the two zones, the percent of households by the possible minimum number of LLINs that could potentially be received from the two keep-up strategies. In each of the two zones up to 79%, households in the Lake zone and 65% in the Southern zone, could potentially receive a minimum of three LLINs, two LLINs or one LLIN within a year. Accordingly, Schools are the main source of the LLINs in each of the two zones. Notably are the households that would not be reached by any of the two keep-up strategies– 21% and 35% of the households in the Lake and Southern zones respectively, would not directly receive LLINs from any of the two strategies.

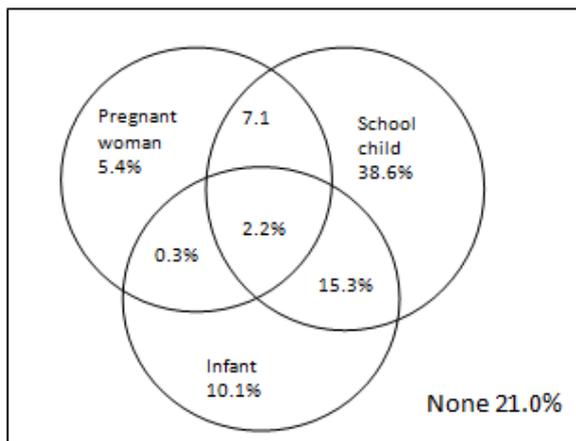


Figure 1a: Potential reach by keep-up strategies in Lake zone

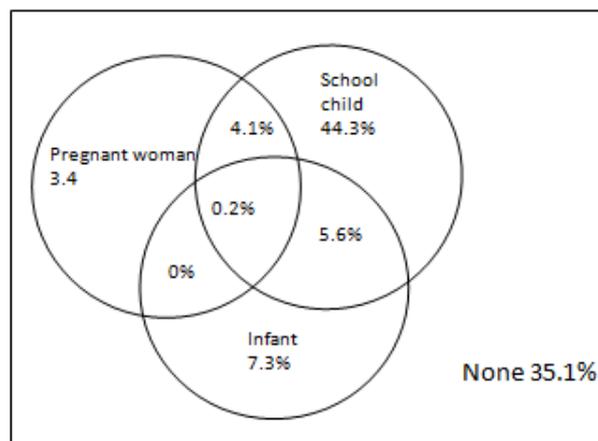


Figure 1b: Potential reach by keep-up strategies in Southern zone

The School-based Net Programme

Considering that eligibility of a household is determined by having a child registered in school and in specific grades (regardless of age) it was important to inform which children were in school. Categorization of children by age and school registration status is shown in Figure 2. A substantial percent of children were not enrolled in school up to the age of 10 years– as shown in the Figure 2, only about 65% and 80% of the children aged between 7 and 10 years were enrolled in school in the Southern and Lake zones, respectively. Another important message from Figure 2 is about the substantial proportion of those aged twenty and above who were still in secondary schools. Variation between the two zones of the percentages of those at school in the early age (7-10) and later age (21-25) is noticeable.

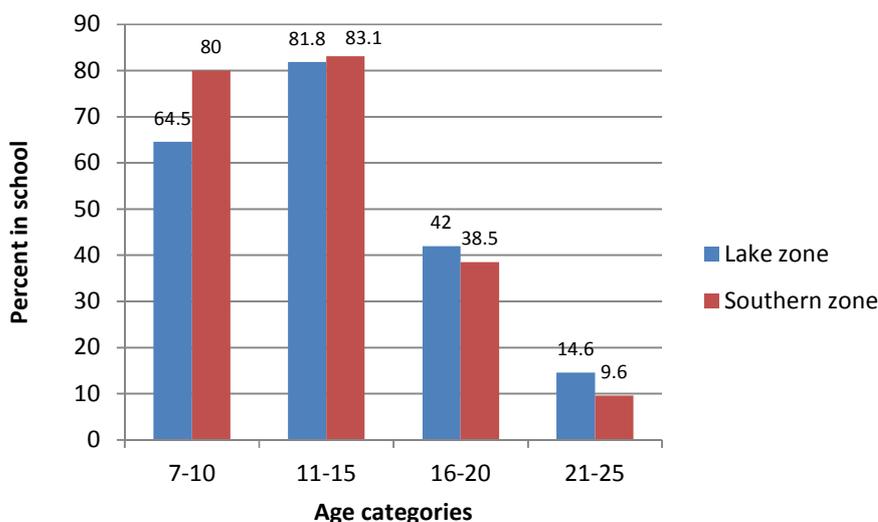


Figure 2: School age children enrolled in primary or secondary school

As always, community awareness of a new programme is critical to its success. To assess awareness of the SNP, heads of households were asked whether they had heard about it and those who responded with a “Yes” were asked about the source of that information. As shown in Table 3, over 90% of the heads of households in Mtwara Urban had heard about SNP as opposed to 79% in Nachingwea district. In both districts, the main source of information was school children either in the same household as the head or in another. While radio ranked second as a source of information in Mtwara Urban (34%), that source was reported in Nachingwea by only about 9% of the heads of households. Hearing from a friend or neighbor was an important source in Nachingwea (18%). As would be expected, heads of households with children in eligible classes had their children as the main source of information followed by radio while those in other households heard about the programme mainly from radio and children from neighboring households.

Table 3: Awareness of SNP among heads of households

Information	Mtwara Urban		Nachingwea	
	N	n (%)	N	n (%)
Heard about SNP	296	277(93.6)	295	232 (78.6)
Main source of information				
Radio	277	95 (34.3)	232	20 (8.6)
School child in the household		86 (31.1)		73 (31.2)
School child in another household		72 (26.0)		83 (35.8)
Friend/neighbour		18 (6.5)		42 (18.1)

In the surveyed households, a total of 282 students were eligible for LLIN from SNP. Of those, 159 (56.4%) were from Mtwara Urban (Table 4). Information was obtained for 156 (98.1%) in Mtwara Urban and 120(97.6%) in Nachingwea district. Most of the students were in primary schools particularly in Nachingwea district (94%). In both districts, over 96% of the students were registered in day schools. There were slightly more girls than boys, more pronounced in Nachingwea district (55%)

The eligible children were registered in a total of 37 schools in Mtwara Urban and 23 in Nachingwea district.

Table 4: Children eligible for SNP

	Mtwara Urban N=159		Nachingwea N=123	
	n	%	n	%
Information available	156	98.1	120	97.6
Primary school	121	77.6	115	93.5
Day school	152	97.4	116	96.7
Girls	80	51.3	66	55.0

Parents/guardian knowledge about the programme

For each household a parent/guardian of the SNP eligible children was sought and consented for responding to the module that was specific for SNP. A series of few questions were asked to establish the awareness and knowledge the respondent had about the SNP. Only 10/217(4.6%) respondents to that module were not respondents to the household module. Thus, those (10) were asked about whether they ever heard about the school net programme and sources of that information. Of those 8 (80%) said they had heard about the programme mainly from school children, posters and radio. Responses to the other questions are shown in Table 5. In both districts correct knowledge among parents/guardians about who should receive the LLIN at school was limited to very few, only 19% in Mtwara Urban and 4% in Nachingwea district. Partial mention of eligibility was comparatively higher in both districts, 53% & in Mtwara Urban and 59% in Nachingwea district.

Table 5: Parents/guardians awareness of and knowledge about SNP

Information	Mtwara Urban		Nachingwea	
	N	n (%)	N	n (%)
Knew the issuing dates	121	63 (52.1)	96	43 (44.8)
Stated eligibility correctly (To whom would the LLIN be issued to)	121	23 (19.0)	96	4 (4.2)
Mentioned only some of the classes/grades	121	65 (53.7)	96	57 (59.4%)

Receipt of a net by eligible households and children

Households

Of the 591 surveyed households in the Southern zone, 37% were eligible to receive a LLIN from SNP this year. Of those eligible, 81% received at least one LLIN, 80% in Mtwara Urban and 82% in Nachingwea district (Figure 3). Few of the non-eligible households received the LLINs from SNP, 2.5% in Mtwara Urban and only one in Nachingwea. Several circumstances contributed to the shortfall of 19% – children in boarding schools had not delivered the nets to the households, some children did not attend school on the issuing days, few children sent the net to another household (details are included under the sub heading “LLIN receipt and delivery to the household”).

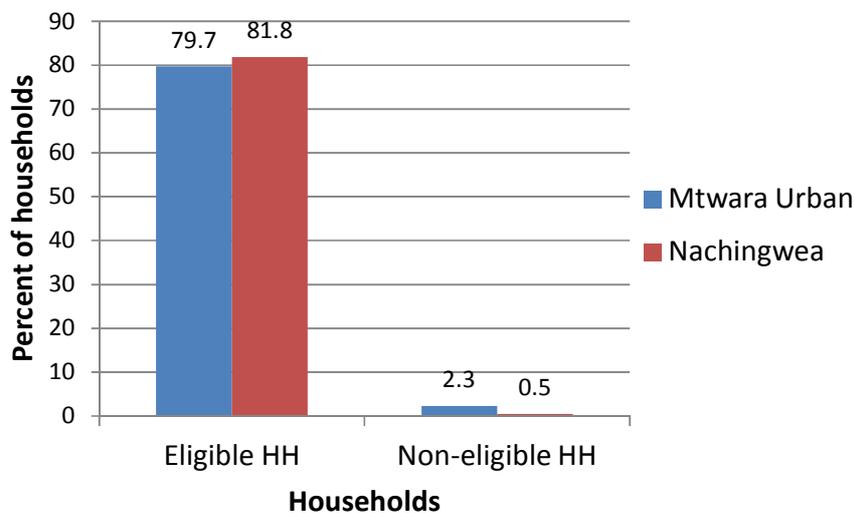


Figure 3: Household receipt of LLIN from SNP

School children

Of the 276 school children who were eligible for LLIN from the SNP, 231 (83.7%) received LLIN. A higher proportion of those who were in primary 5 and 7 as well as girls received LLIN (Table 6). The “do not know” responses from the parents/guardians for children who were registered in secondary schools explain the low score for that category, 5 (12.5%) gave that response. About 3% of the eligible school children were in boarding schools.

Table 6: Received LLIN by categories

Categories of students	Southern zone	
	Eligible for SNP net (N)	Received the net n (%)
Primary 1 and 3	146	121(82.9)
Primary 5 and 7	90	79 (87.8)
Secondary school	40	31 (77.5)
Girls	146	129 (88.4)
Boys	130	102 (78.5)
All	276	231 (83.7)

Restricting the estimates to only those who were reported to have attended school on the days of issuing the LLINs, 94.4% received the LLINs, 93% in Mtwara Urban and 97% in Nachingwea district. Excluding boarding schools, a total of 223 (98.7) of the received LLINs were taken to the child's household.

Figure 4 summarises indicators for the LLINs from receipt to use. While receipt was fairly high (83.7), use of the LLINs that were in the household on the interview date was relatively very low (41%). Of the 38 school children who did not receive LLIN, 24 (63%) were reported by their parents/guardians as not having gone to school on the issuing dates.

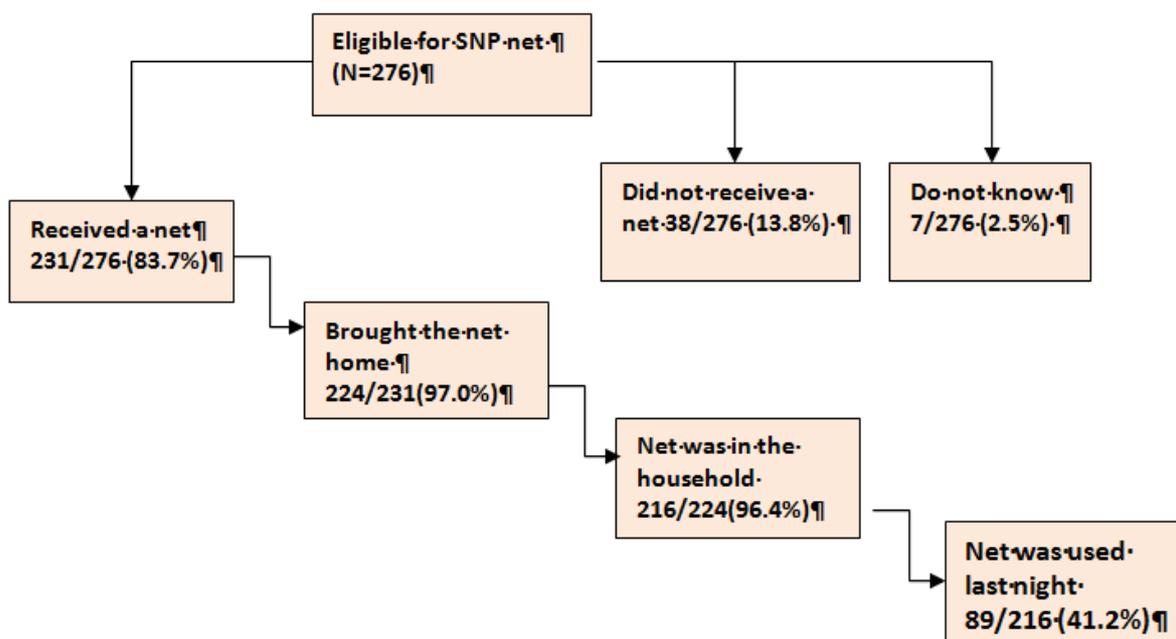


Figure 4: Steps involved in delivering the LLIN in the household and use

LLIN receipt and delivery to the household

Of 38 children whose parents/guardian reported to have not received a net, 19 (50%) could be verified from the school registers that indeed they were not given a net. The most frequently stated reason for missing the net was “currently moved to the school” thus not in the register. In one particular school, all standard seven children were not in school on the issue dates– they had gathered somewhere out of the school preparing for exams. The teachers informed the team that their nets were stored and would be issued to them once they return to school. Another two school children were issued a net but did not deliver them to the household—one took the net to his grandmother and another delivered the net to her biological mother who lived in another household. One student received the net but did not take it to the household and there was no information about what he did with the net⁶.

Eleven (4.7%) of the school children who attended school on the issuing days did not receive a net and 7 parents/guardians stated that they asked the children to give reasons for not receiving the net. Several school children said they did not know the reasons for missing the net 3 (43%), one stated that the nets were not enough and another had just been transferred to the school after registration was done.

Information brought to the household by the children

In order to assess the extent to which recipients (school children) of the LLINs delivered correct information/messages to the households, parents/guardians were asked to state the information delivered to them about the issued net. Most LLINs recipients (85.8%) informed their parents/guardians

⁶ Validation of the household reports against the school records was not complete because access to issuing registers was not fully successful

that the nets were for themselves. Only 8.4% delivered the correct message to the household that the net (LLIN) was for the household. No student informed the parents/guardians that the net could be given to another household. Similar observation was reported in qualitative findings – parents/guardians stated that child said “the net is mine”.

Use of the LLIN from SNP

Not including boarding schools, 98.7% (of the issued nets reached the households). However, only 41% (89/216) of the nets received from the SNP and were in the household at the time of interview, were used in the previous night. Of them, **58% (52/89) were exclusively used by the school child given the net (slept under in the previous night).** **Twenty five percent (22/89) of the nets that were used last night were shared between the school child who was issued the net and other family members.** The remaining 17% (15/89) was used by other household members without the child who received the net. Who slept under that particular net was independent of the message the child brought to the household.

Reasons for not using the net

For each LLIN received from the SNP reported not to have been used in the previous night, respondents were asked to state the reasons for the non-use. Of the 127 LLINs that were in the household but were not used last night, 95 (75%) were not hanged/stored. “No mosquitoes” was the second most frequently mentioned reason for not using the net, 19 (15 %). Households that had sufficient number of nets (equal or greater than the number of sleeping spaces) had a higher proportion of nets that had not been hanged (53.2%) compared to those households where the number of nets were less than the number of sleeping spaces, where 35% of the nets had not been hanged by the time of the survey.

Sleep under LLIN in the previous night by school children who received LLIN from SNP and those who did not receive is shown in Figure 5. Estimates (sleep under LLIN) that included LLIN from SNP were higher for school children who received LLIN from SNP (50.5%) compared to those who did not receive LLIN (37.2%). However, estimates with the LLIN from SNP excluded, showed a higher percent of those who did not receive LLIN from SNP slept under LLIN (29.2%), compared to 24% those who received LLIN from SNP. Among those who received LLIN from SNP, use doubled as a result of those LLINs while for those who did not receive the LLIN, use increased by 8 percent.

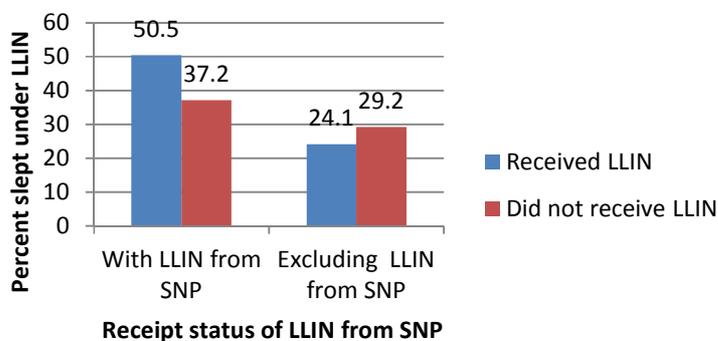


Figure 5: School children slept under LLIN

Nets

Of the nets in the households, proportion LLINs was markedly variable across districts. While in Nachingwea, 92% of the owned nets were LLINs, Mtwara were only 59%, Chato and Sengerema were 87% and 85% respectively.

Source of net

Contribution of the School Programme into the nets owned by the households was assessed using the information about the source of each net. Similar to the 2011 survey, the Universal Catch up Campaign remained the main source of nets in both zones but with a lowered proportion (57% in the Lake zone and 42% in the Southern zone). While the second major contribution in the Lake zone was upgraded voucher (19%), unsubsidized purchases ranked second in the Southern zone (29%). School Net Programme as a source of the owned nets ranked third (16%) in the Southern zone (Table 7). However, it contributed 22% of all the owned LLINs in the surveyed household in Southern zone. It is worth to note that, 85% of the unsubsidized purchased nets were untreated (MBU NET and SAFI NET brands).

Table 7: Source of nets

Source of net	Lake zone		Southern zone	
	2011 N=2554	2013 N=1292	2011 N=1792	2013 N=1453
HP infant	0.8	1.0	0.8	0.2
HP preg. women	1.8	0.5	1.6	0.3
Upgraded voucher	4.0	18.9	1.6	9.5
U5CC	17.0	3.0	4.7	0.5
UCC	53.0	56.8	67.4	42.1
SNP	-	-	-	15.6
Purchased	16.8	17.9	20.1	28.5
Other	6.6	2.0	3.8	3.3

Net ownership

In order to establish whether a net was LLIN or not, information about each net in the household was gathered. Net information included source, payment mode, size and brand. Thus, it was possible to categorize nets as untreated net or LLIN. Table 8 shows that 89% and 92 % of the surveyed households

in the Lake and Southern zones respectively, had at least one net. Accordingly ownership of at least one LLIN per household in the Lake zone had declined from over 94% in 2011 to 84% in 2013. In the Southern zone ownership of at least one LLIN was 80%, substantially lower than the 2011 estimates of 94%.

Table 8: Household ownership of nets

	N	At least one net (any)	At least one LLIN
		% (95% CI)	% (95% CI)
Lake zone*			
2008	1176	61.5 (53.4-68.9)	
2009	891	91.6 (89.5-93.3)	75.5 (72.6-78.2)
2010	889	90.7 (88.6-92.4)	76.3 (73.4-78.9)
2011	887	97.8 (96.6-98.5)	94.4 (92.7-95.7)
2013*	598??	89.4 (86.7-91.7)	84.0 (80.7 -86.6)
Southern zone			
2008	875	68.7 (61.7-74.9)	n/a
2009	592	85.8 (82.9-88.3)	43.4 (39.5-47.4)
2010	591	73.8 (70.9-76.5)	45.4 (41.6-49.2)
2011	592	99.3 (92.3-96.0)	94.4 (92.3-96.0)
2013	592	91.9 (89.4-93.8)	80.2 (76.8-83.2)

*only Sengerema and Chato districts in the Lake zone

Ownership at district level

LLIN ownership at district level is shown in Table 9. In all the five surveyed districts, ownership of at least one LLIN had declined as compared to the 2011 levels particularly in Mtwara where the current ownership coverage was 75% from 95% in 2011.

Table 9: LLIN ownership by district (at least one LLIN)

District	2011		2013	
	N	% (95% CI)	N	% (95% CI)
Mtwara Urban	296	95.3 (92.2-97.1)	296	75.3 (70.2-79.9)
Nachingwea	295	97.0 (94.3-98.4)	295	85.1 (80.6-88.7)
Chato	298	92.6 (89.2-95.0)	298	81.9(77.1-85.8)
Sengerema	298	94.9 (91.8-96.9)	298	86.2 (81.9-89.7)

Number of nets owned

Decline in the percentage of household ownership of above three nets and increase of zero or one was observed in both zones but remarkable in the Lake zone (Figure 6). While in 2011 only 6% of the households had only one net in the Lake zone that had increased to 27% in 2013. In the same zone, over 50% of the households had at least four nets in 2011 but only 17% had that number of nets in 2013. The less dramatic change in the Southern zone was likely due to the LLINs from the SNP.

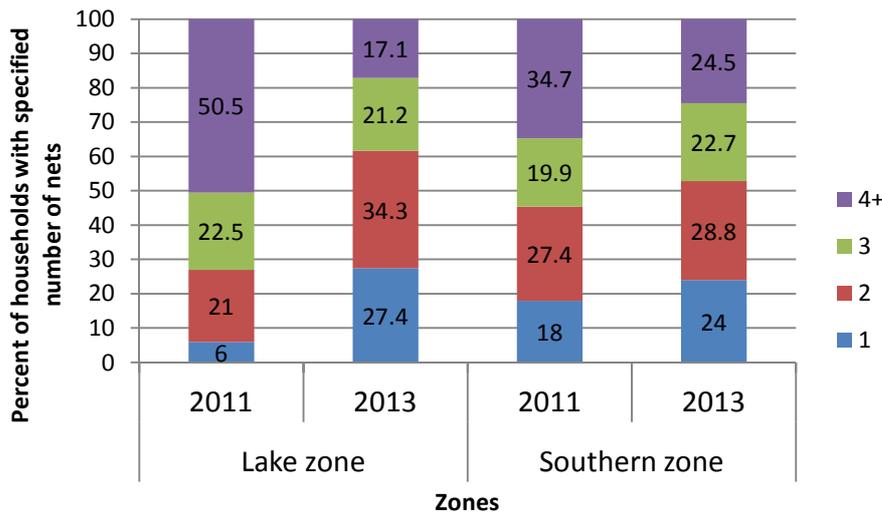


Figure 6: ownership of specific number of nets

Stratification of the household ownership of nets in the Southern zone by eligible and non-eligible households is presented in Table 10. While ownership of at least one LLIN in the households that had at least one child in the targeted classes was 96%, only 71% of the non-eligible households owned at least one LLIN. About 51% of the households in the eligible households had enough LLINs to cover all sleeping spaces, non-eligible households had enough to cover only about a third of the sleeping spaces (35%).

⁷Ownership of at least one LLIN per two people was slightly higher in the eligible households (57%) than in the non-eligible households (44%). Surprisingly, household-level indicators of LLIN use did not favour the eligible households, 18% of the eligible households had all members sleeping under LLIN and 24% of the non-eligible households⁸. All indicators were lower in the Lake zone. To assess the situation in terms of ownership and use of LLINs before distribution of LLINs from SNP in the Southern zone, analysis was repeated excluding the LLINs from SNP— this is considered as quasi-baseline. As shown in the last two columns of Table 10, the LLIN from the SNP pushed all the indicators upwards.

Worth a note: in 2011 only 49% of the households in the Lake zone had at least one LLIN per two people but 78% in the Southern zone.

⁷ Number of LLINs in a household divide by number of sleeping spaces in a household if ≥ 1 , then had enough to cover all sleeping spaces

⁸ The household size can in part explain this seemingly contradictory observation- in the Southern zone, the mean household size was 5.1 in the eligible HHs and 3.5 in the others

Table 10: LLIN by SNP Eligibility status at household-level

	Lake zone N=596 n(%)	Southern zone			
		Eligible HHs N=220 n(%)	Non-Eligible HHs N=371 n(%)	All N=591 n(%)	
				Analysis with SNP net	Analysis without SNP net
Own any net	89.4	217(98.6)	326 (87.9)	543 (91.9)	525 (88.8)
Own at least one LLIN	84.0	212(96.4)	262 (70.6)	474 (80.2)	428 (72.2)
Own enough LLINs to cover all sleeping spaces	206 (34.6)	111 (50.5)	128 (34.5)	239 (40.4)	177 (30.0)
Own at least one net per 2 people	179 (30.0)	168 (76.4)	241 (65.0)	408 (69.0)	358 (60.6)
Own at least one LLIN per two people	134 (22.5)	125 (56.8)	164 (44.2)	288 (48.7)	238 (40.3)
All members slept under a net	107(18.0)	88(40.0)	168(45.3)	256(43.3)	187 (31.6)
All members slept under LLIN	79 (13.3)	39(17.7)	90(24.3)	129(21.8)	98 (16.6)

Net ownership and equity

A decrease in the percent of households that owned at least one LLIN is observed between 2011 and 2013 across the wealth quintiles. A more marked decline is in the highest quintiles that dropped from over 90% in 2011 to just over 70% in 2013. In both the Lake and Southern zones, households in the highest quintile had the lowest percent of LLIN ownership (at least one). Equity ratio is over one in both zones (Figure 7).

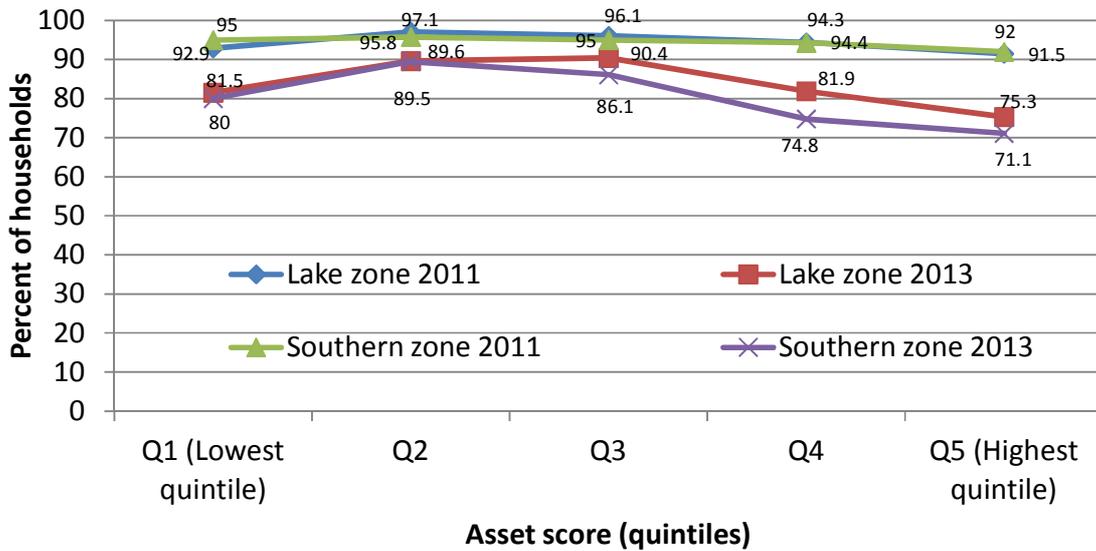


Figure 7: Households owning at least one LLIN by wealth quintiles

Considering that the School Net Programme would increase LLINs in the households, we disaggregated the Southern zone data into eligible and non-eligible households and estimated ownership accordingly. Figure 8 shows that within expectation, a higher percentage of the eligible households owned at least one LLIN at the levels comparable to the 2011 after the Universal Catch up Campaign. Surprisingly, the two highest wealth quintiles in the non-eligible households had the lowest percent of household with at least on LLIN.

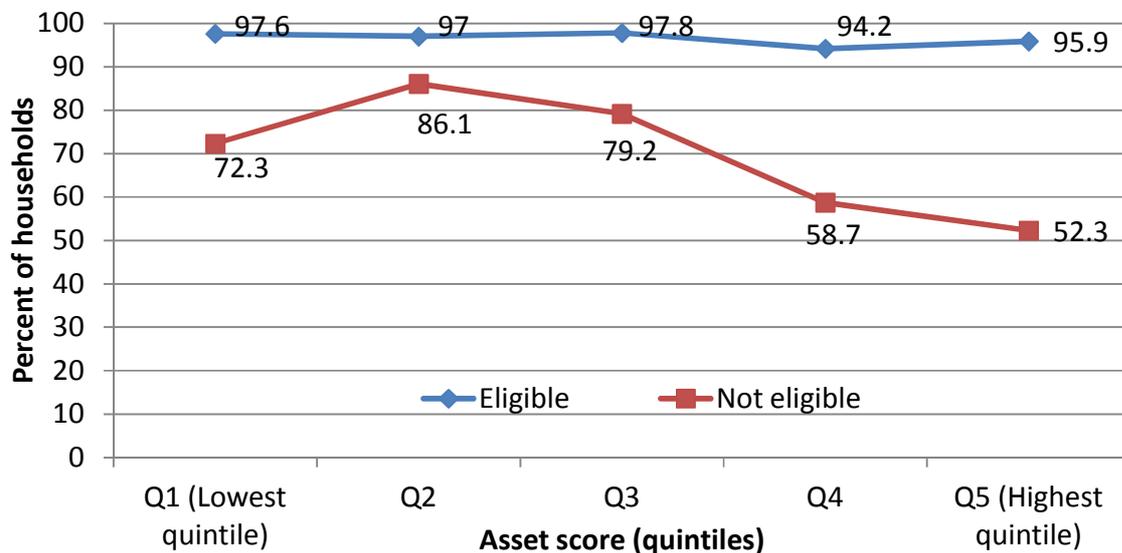


Figure 8: LLIN ownership by SNP eligibility status

Net use

A total of 1292 and 1453 nets were reported in the surveyed households in the Lake and Southern zones, respectively. However, only 72% of the nets in the Lake zone and 62% Southern zone, were reported to have been used in the night preceding the survey. A more marked variation of use of nets was observed across districts, in Nachingwea only 47% of the nets were used in the previous night while the highest proportions were in Chato and Mtwara (75% and 72%). Sengerema reported use of 68% of the nets.

For each of the net that was reported as not used in the night preceding the survey, respondents were asked to state reasons for not using that net. **Results indicated that the most frequently mentioned reason for not using the net was “the net is not hanged or is stored”, 115/363 (31.7%) in the Lake zone and 257/543 (47.1%) in the Southern zone.** This was followed by “no mosquitoes around” in both zones, **95/363 (26.2%) in the Lake zone and 108/543 (19.9%) in the Southern zone.** Worn out net as a reason for not using was mentioned for 42/363 (11.6%) nets in the Lake zone and 36/543 (6.6%) in the Southern zone. Other reasons mentioned with lower frequencies included the person who uses the net had travelled or the net was washed. The questionnaire did not include a question to establish reasons for not hanging the net but qualitative narrations provide insights.

Sleep under a net in the night preceding the survey is a coverage indicator of use of net. We report here sleeping under LLIN. Overall, 38% and 47% of household members in the Lake zone and Southern zone respectively, slept under LLIN in the night preceding the survey.

As shown in Figure 9, in both zones a much higher proportion of people in all age categories were reported to have slept under LLIN in 2011 compared to the 2013 estimates. In the Lake zone estimates for all age groups were lower than those for the Southern zone where the School Net Programme was piloted. Both ownership and timing (dry season) of the survey contributed to the low use.

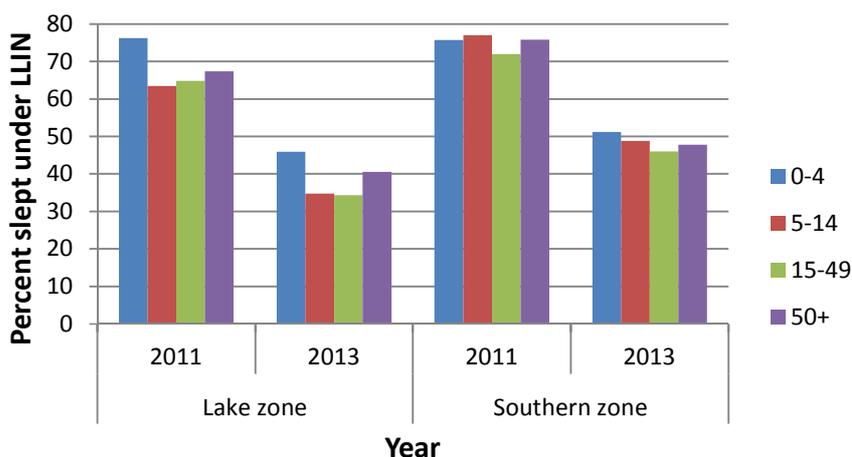


Figure 9: Sleep under LLIN by age groups

District level LLIN use estimates

District estimates for LLIN use by various groups of people indicated that Children under five had the relatively higher coverage compared to the other groups except for Mtwara where a higher percent of school age children (5-14) slept under LLIN. Chato district had the lowest coverage in all age groups (Table 11).

Table 11: LLIN use by district

District	All household members % (95% CI)	Children <5 % (95% CI)	Children 5-14 % (95% CI)	Women 15-49 % (95% CI)
Mtwara Urban	50.1 (45.8-54.5)	51.6 (43.3-59.8)	60.4 (53.7-66.7)	46.1 (40.3-52.0)
Nachingwea	45.5 (40.4-50.6)	48.6 (40.1-57.1)	41.6 (34.2-49.4)	45.8 (39.2-52.6)
Chato	27.7 (24.8-30.7)	34.2 (29.4-39.4)	26.5 (22.6-30.8)	26.5 (22.3-31.2)
Sengerema	48.9 (44.4-53.4)	60.8 (54.2-67.1)	44.3 (38.7-50.1)	52.0 (46.6-57.1)

Use of LLINs by household eligibility status

Coverage in use of LLIN (sleep under LLIN) was higher in the eligible households across all age groups in the Southern zone. Considering that most of the school children who received the LLINs personalized them, we would expect use in that age group (5-14) to be higher in the eligible households but the percentage difference between use by those in the eligible and non-eligible households compared closely with the rest of the age categories. However, use of LLINs from SNP was highest in the school age group (5-14). As expected general use of LLINs among children under five was highest in both the eligible and non-eligible households (Figure 10).

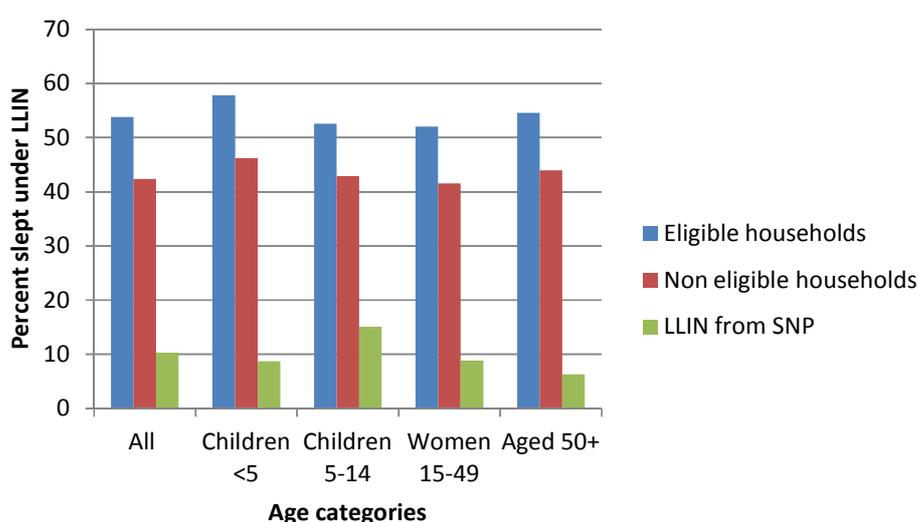


Figure 10: LLIN use by household eligibility status in the Southern zone

Use of nets by ownership of optimal number of nets

Ownership of a net is a prerequisite for use, it has been established that a household that owns at least one net per two people is likely to have all its members sleep under a net. Table 12 shows use of LLINs by household members as per categorised number of owned LLINs. Consistently, households that had at least one LLIN per two people had a much higher proportion of its members sleeping under LLIN compared to those in households with less number of nets per person. In both zones, children under five had a substantially high coverage, 78% in the Lake zone and 73% in the Southern zone. Women of reproductive age (15-49) in Southern zone had a coverage of 70%.

Table 12: Use of LLINs by household members as per the number of owned LLINs

	HH had at least one LLIN per two people		Households had less than one LLIN per two people	
Lake zone				
	N	n (%)	N	n (%)
Household members	565	367 (65.0)	3205	1043 (32.5)
Children under 5 years	89	69 (77.5)	680	284 (41.8)
Children 5-14 years	169	104 (61.5)	1095	336 (30.7)
Women 15-49	121	77 (63.6)	616	203 (33.0)
Aged 50+	90	53 (58.9)	235	79 (33.6)
Southern zone				
Household members	1017	703 (69.1)	1217	354 (29.1)
Children under 5 years	121	91(75.2)	178	68 (38.2)
Children 5-14 years	270	186 (68.9)	300	93 (31.0)
Women 15-49	263	183(69.6)	359	97(27.0)
Aged 50+	183	111(60.7)	118	35(29.7)

Equity and use of LLINs

Overall coverage in use of LLINs, has shown substantial decline between 2011 and 2013. However, wealth subgroups experienced varied changes over time (Figure 11). Coverage in the use of LLINs among household members in the Lake zone decreased from 67% in 2011 to 37% in 2013 in households of lowest wealth quintile and from 66% to 40% within the same time period in households of the highest quintiles. Coverage was comparatively higher in the Southern zone and in the first four wealth quintiles

but not the fifth. Coverage in the lowest quintile households dropped from 83% in 2011 to 44% in 2013, the highest quintiles dropped from 61% in 2013 to 38% in 2013 (equity ratio for 2013 was 1.2).

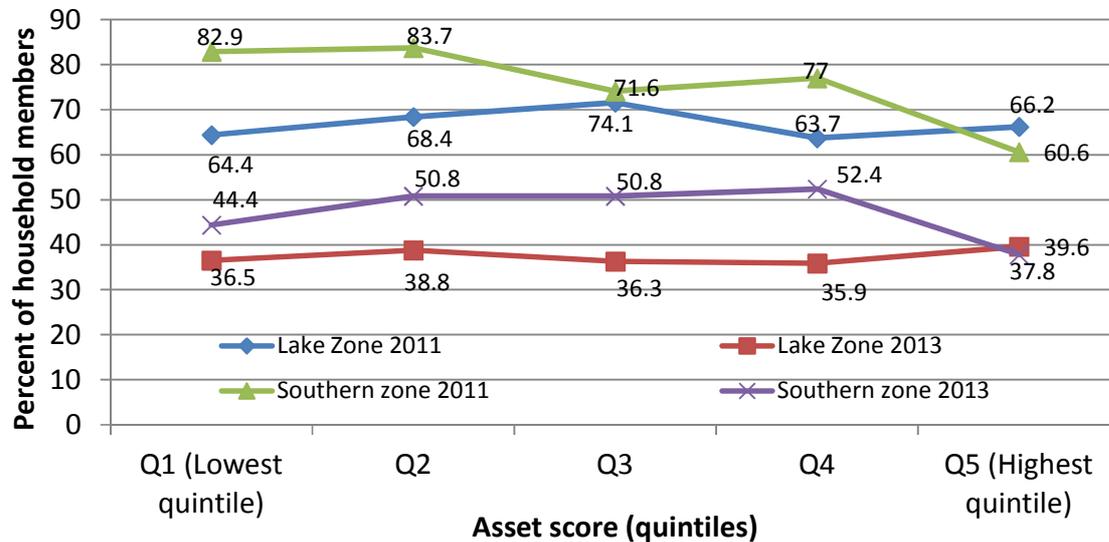


Figure 11: LLIN coverage among household members by wealth quintiles

Sleeping spaces covered

Estimates of percentages of sleeping spaces covered by LLINs was derived by using information about the number of sleeping spaces and number of LLINs in the households. Subsequently, it was possible to estimate the percentage of sleeping spaces that were not covered by LLIN in each of the two zones. In the Lake zone, a total of 1707 sleeping spaces were reported and LLINs in the households at the time of the survey were 1108. As such, households had LLINs enough to cover about 65% of the sleeping spaces, thus up to 35% were not covered by an LLIN. Households in the Southern zone, where the school net programme was piloted had LLINs that could only cover a proportion of sleeping spaces comparable to the Lake zone. In that zone, a total of 1544 sleeping spaces were reported and 1051 LLINs were in the households at the time of the survey. Therefore, the LLINs in those households would be enough to cover 68% of the sleeping spaces.

Number of LLINs in the household at the time of the survey compared to the number of sleeping spaces, provides an insight about the LLIN gap that needs to be filled (Figures 12a and 12b)⁹. As would be expected, most households had fewer numbers of LLINs than the sleeping spaces and the gaps were more pronounced in households with relatively higher number of sleeping spaces. Of the households in the Lake zone that had only one sleeping space, 36% of them had no single LLIN and 31% of such in the Southern zone. In 2011, that indicator (no single LLIN in households with one sleeping space) was 17% and 14% the Lake and Southern zones respectively. In both zones, households that had three sleeping spaces, only 34% had at least three LLINs.

⁹ The value labels are the percent of households with LLIN equal to the respective sleeping spaces

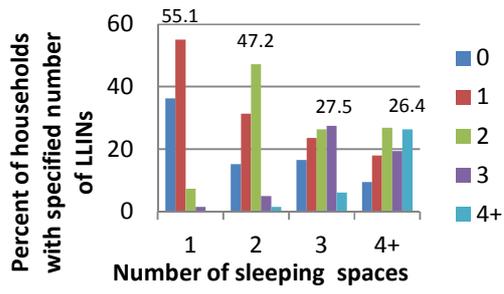


Figure 12a: Number of LLINs owned as per sleeping spaces- Lake zone

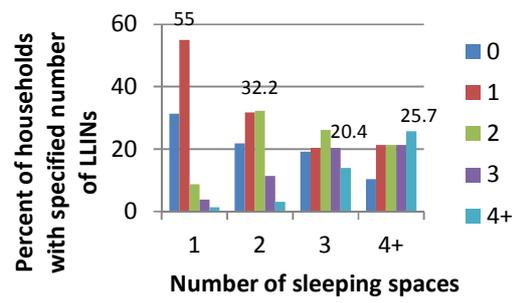


Figure 12b: Number of LLINs owned as per sleeping spaces – Southern zone

Discussion

The report presents results of a rapid evaluation of the School-based Net Programme piloted in the Southern zone. The survey purposed to assess whether the targeted school children received the LLINs and delivered them to the households. It also set out to assess the contribution of the LLINs from the SNP to the coverage of LLINs (ownership and use) as well as stakeholder knowledge and perceptions about the SNP and LLINs in general. Values of both ownership and use of LLINs were substantially lower than those documented soon after the UCC in 2011.

The school-based Net Programme

Awareness of any programme has a bearing in its success. Percent of the interviewed heads of households that had heard about the programme was very high (94%) in Mtwara Urban and fairly high in Nachingwea district (79 %). The main sources of the information were school children and radio. This might suggest that other strategies for delivering that information did not reach the community adequately.

A high percent of eligible school children received the LLIN (84%) and most of the children delivered the issued LLIN to the households (97%). This is indicative that the programme purpose of getting the LLINs to the households through school children was well achieved. Defining eligibility as a household with at least one child in primary or secondary school, 63% and 54% of the households would be eligible in the Lake and Southern zone, respectively. The national estimate is 62% households.

Considering that a school child was intended to be a vehicle to deliver the LLIN to the household, the perception by the school child that the net was his/hers has a potential to defeat the purpose. The message delivered to the household by most of the school children is that the LLIN belonged to the child (86%). However, information about who slept under those LLINs revealed substantial sharing with other household members. Offering the LLINs to other households that had a need, hardly happened, but this is not unexpected taking into account that most of the recipient's households had gaps to be filled by those nets.

Net ownership

The School-based net programme would be expected to contribute into maintenance of the high coverage achieved in 2011 following mass distribution of LLINs. Assessment of the contribution of the programme in LLINs at household level was done using two main indicators; ownership of *at least one LLIN* and ownership of *at least one LLIN per two people* as compared to 2011 estimates and Lake zone where the SNP was not implemented. At the time of the survey 84% and 80% of household in the Lake and Southern zone respectively owned at least one LLIN, as expected, this was lower compared the 2011 estimates where in both zones, 94% of the households owned at least one LLIN. However, the *at least one LLIN* indicator is not ideal for determining temporal changes. We used household ownership of *at least one LLIN per two people* which is considered as optimal for each person to sleep under LLIN and can show changes of ownership over time. In the Lake zone that indicator was 49% in the 2011 and 23% in 2013. The Southern zone where SNP was piloted that indicator was 78% in 2011 and 49% in 2013. In

the Southern zone, a higher proportion of eligible households had at least one LLIN per two people (57%) that is likely an impact of the SNP.

Universal Coverage Campaign remained the main source of nets in both zones. In the Southern zone, the SNP contributed 22% of all LLINs owned. It is however, necessary to think critically about production and importation of untreated Nets. In the Southern zone particularly in Mtwara Urban, worn out or even new LLINs had been replaced by ordinary nets (untreated MBU and SAFI nets) purchased from retailers. Production and importation of untreated nets undermines the goal of having people sleep under LLINs.

Use of LLINs

Coverage of LLIN at individual level, as measured by sleep under LLIN in the previous night was very low in all age groups compared to the levels achieved in 2011. While 67% of people in the surveyed households in the Lake zone slept under LLIN in 2011, only 38% of the people slept under LLIN in 2013. In Southern zone, LLIN coverage among all household members was 75% in 2011 and 47% in 2013. Use of LLIN in households where there was at least one LLIN per two people was much higher in both zones (65% in the Lake zone and 69% in Southern zone). The observed relatively higher use of LLINs in households that had sufficient number of LLINs (at least one per two people), underscores the necessity of delivering to the households sufficient number of nets for high use coverage.

Low use of LLINs is both a result of low ownership and behavioural. Programmes can deliver LLINs to the households but use is entirely determined by the recipient of the net. The intensive Behavioural Change Campaigns have potentially improved understanding of the need for using a net throughout the year. However, behavior has a substantial contribution to the observed low use of LLINs. The survey was conducted during dry season (August 2013) when mosquito densities are relatively low and thus, low perceived need for using a net. This perception was evidenced in the high frequency of “no mosquitoes” as a reason for non-use of nets.

Another important factor that might have contributed to the low use of nets in the Lake zone is presence of another vector control intervention, IRS had been implemented in the survey districts only few months before the survey.

Use of SNP net

The survey in the Southern zone, happened after about 4 weeks from the dates of issuing the LLINs. Only 89 (41%) of those nets that were in the household were used in the previous night. Most of the nets had not been hanged (75%) and perception that there were no mosquitoes (15%). School children who received the LLIN were the majority of those who slept under the net in the previous night (58%). Sharing the LLIN with other members of the household or letting it be used entirely by others was also substantially high (42%).

Sleeping spaces covered by LLIN

In the Lake zone, a total of 1707 sleeping spaces were reported and LLINs in the households at the time of the survey were 1108. As such, households had LLINs enough to cover about 65% of the sleeping

spaces, thus up to 35% were not covered by an LLIN. In the Southern zone, where the school net programme was piloted had a total of 1051 LLINs and 1544 sleeping spaces, thus the LLINs in those households would be enough to cover 68% of the sleeping spaces. In order to achieve malaria control targets the gap of over 30% of the sleeping spaces need to be filled.

Conclusion

School Net programme is a feasible strategy to reach households with LLINs. A higher coverage is achieved in combination with the TNVS. Other approaches need to be identified for the households that are not within the reach of these two keep-up strategies.

Some limitations including timing of issuing the LLINs is important. For example it is not certain whether the LLINs delivered to school children in boarding schools will ever be delivered to the households.

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Qualitative perspectives

Table 1q: Interviews conducted

No	Site	Type	Name	Number
1	Mtwara	IDI	District education officer	1
2	Mtwara	IDI	District commissioner	1
3	Mtwara	IDI	Malaria focal person	1
4	Mtwara	IDI	Ward education officer	2
5	Mtwara	IDI	District Medical officer	1
6	Mtwara	IDI	Primary school teachers	3
7	Mtwara	IDI	Secondary school teachers	2
8	Mtwara	FGD	Male focus group discussions	2
9	Mtwara	FGD	Female focus group Discussions	2
10	Nachingwea	IDI	District education officers	2
11	Nachingwea	IDI	Malaria focal person	1
12	Nachingwea	IDI	Ward education officer	2
13	Nachingwea	IDI	Secondary school teachers	2
14	Nachingwea	IDI	Primary school teachers	3
15	Nachingwea	FGD	Male focus group discussions	2
16	Nachingwea	FGD	Female focus group Discussions	2
17			TOTAL INTERVIEWS	29

Results

With the purpose of contextualizing the focused discussions with community members, the subject was introduced through discussion about malaria and control strategies followed up with bednets. The subject on School Net Programme was then introduced.

Community perception about malaria and prevention

Malaria was unanimously mentioned as a common disease that affects adults and children. Some participants indicated that malaria becomes more threatening during rainy seasons. Several malaria prevention techniques were reported to be used by community members, bednets, cleaning environment and mosquito repellants but most of them recommended bednets as the best malaria control tool. Unexpectedly, retreatment using “NGAO” was mentioned.

“health problems that we encounter include malaria, fever, skin conditions. Malaria is the leading and young children suffer most. The quality of nets they bring to us is not good because mosquitoes can penetrate” (FGD men Mtwara Urban)

“In our village the main health problem we face is malaria, during rainy season malaria disturbs us a lot in our homes” (FGD women, Nachingwea)

“...is to use a net and environmental cleanliness and to treat a net, the insecticide, those in... that insecticide NGAO to use it for treating nets” (FGD women, Nachingwea)

Concern about getting mosquito bites before bed time was expressed by one FGD participant, and in his view, bednets were not the best malaria prevention strategy as long as they offer protection only in bed.

“It is true it is not an effective strategy eeh because there are mosquitoes that bite in the evening as we sit talking .. yes you cannot take a net and cover yourself in such a situation” (FGD men, Nachingwea)

Sources of nets

Some participants in the FGDs noted that they get nets through Hati Punguzo program that favors pregnant women and children. They commended that as the cheapest way to own nets as they contribute a small amount of money when they visit antenatal care clinics to secure a net. Universal coverage campaign was also mentioned as another source of nets. Furthermore, participants reported that their school children got nets during the month of July 2013. Purchase from retailers was mentioned by few respondents.

“Hati punguzo is working well and we are thankful, those who receive the voucher never miss to get a net”(FGD men, Mtwara Urban)

“And another one are those which were issued by the government for Tanzanians, I am the one who got it” (FGD men, Nachingwea)

“Just another one, some few days ago children were issued nets at school, some were not given, we therefore have to purchase from shops to protect ourselves against malaria (FGD women, Mtwara Urban)

Community awareness about School Net program

Source of Information and the messages

Most of FGD participants appeared to be well informed about the school net program. Probing about the sources of the information, they noted that media was the main source of information, especially radio. Local radios aired information about the program. Special radio drama was prepared to spread information about issuing dates, eligibility criteria and the use of nets. Some other respondents reported to have heard about the school net program from their school children. Some participants reported that brochures were distributed during net issuing days.

“We heard about the nets in radios and listened to children “we are going to be given nets today”, some received but some missed” (FGD men, Mtwara Urban)

Some few respondents reported to have had no information at all but only saw the nets brought by the children when they returned from school

“For me, I did not receive any information about that programme, I mean there was no any information about those nets other than seeing my child coming home with a net- there was no meeting. (FGD men, Mtwara Urban)

Those who mentioned to have heard about the programme, noted that the information was about who was eligible to get school nets, message about how to use the net from the school net program, some respondents were told by their children to wash nets before they hang for use, while others reported that they had been informed that nets were already treated and would remain effective for five years. However, most participants mentioned that the children that brought the nets home claimed that the nets belonged to themselves (the school children) and not for the household. Only few had the knowledge that if they had excess nets, the remaining could be given to other households that needed the nets (had nets fewer than the needs).

“They said the nets are ours, we school children- s/he just said “mine I have been given at school” (FGD, women Nachingwea)

“The message that we got was the information that nets will be issued according to classes from class one, class three, five and class seven. And the nets will be issued again in the coming year so the one who is in class two this year will be in class three next year and will receive a net. The same for secondary schools the one who was in form one this year will be in form two next year and will receive a net.” (FGD women, Mtwara Urban)

“They issued to class one, class three, they skipped class four and issued to class five (Mmmh), skipped class six and issued to class 7” (FGD women, Nachingwea)

Giving bednets to other households that had no/fewer nets

Among several messages that ought to be delivered to the school children about the issued bednets was about giving out the bednets to other households that had fewer nets than their needs while the recipient's household had excess. The school children were advised to deliver that message to the household. FGD participants reported that when it happened that nets exceed sleeping spaces they tend to keep them for future uses, such as for new sleeping spaces or when they receive visitors. Others noted that they stored and used them when the old nets wear out, and others were kept for new generations. It was also reported in some focus group discussions that it has never happened nets to exceed the number of sleeping spaces, because most of the time they do not change the nets until they had new ones.

“When we happen to have extra nets we store them safely for future use when the current ones wear out” (FGD, women Mtwara Urban)

“And there is another bed when a visitor comes and it happens that its rainy season, I hang it up for him/her, I cannot just leave my visitor unprotected against mosquito bites, that is why I have stored it” (FGD, women Nachingwea)

Some few respondents noted that giving nets to those who had fewer nets is not their responsibility but government's.

Who used the school net?

Most participants noted that school nets were used by the school children themselves because they claimed to belong to them and not the households as they were told by their teachers. However, few parents mentioned nets to have been used by other family members.

“The child who brought the net only him/her uses the net all by her/himself”(FGD men, Nachingwea)

“Me, in my household the bednet from school is used by the grandmother of the child who brought the bednet because the child already had his/her own but his grandmother did not have one (FGD men, Mtwara Urban)

Perceived benefit of the school bednets in the households

Within all 8 FGDs, participants commended the program for increasing the number of nets in the households that would subsequently reduce malaria transmission. They also stated that the bednets covered sleeping spaces that had no nets. Those who stated that the program was useful they also commented that bednets are expensive in the commercial market where the price per piece was between nine and ten thousand Tanzanian shillings which many of the people in the rural areas could not afford.

“Personally, I say that the free bednets given to the school children have been of great help in increasing the number of nets in the households and preventing malaria transmission. The school children in particular have been protected against malaria infection because they are not bitten by mosquitoes since they slept under that bednet. The nets have also helped in covering sleeping spaces that were not yet covered. (FGD men, Nachingwea)

A statement from one participant who stated that the SNP was not useful, indicated that perceived value of a bednet is seasonal, high during rainy season when mosquito densities are high but diminishes during dry season when mosquitoes are few. The statement emphasized the importance of timing – in his view bednets should be issued during rainy season.

“Myself no, because in our community to a great extent, mosquito densities increase during rainy seasons and get low when rains end. The school bednets have been issued when the mosquitoes had gone, therefore they will be useful in the coming days, but for now they are not useful because there are no mosquitoes” (FGD men, Nachingwea)

Perceived weaknesses of the SNP by the community

Although distribution of the nets to specific school classes is technically correct but socially it was not well received and understood. The eligibility criterion for a bednet from SNP was perceived as the most critical weakness of the programme. Participants in the FGDs including parents of school children were questioning about the selective aspect of the programme- it was hard for them to understand as to why some school children were not given the bednets. They noted that the program led to misunderstanding between children who lived in the same household if one received a net and the other didn't.

“One challenge is this, some school children received bednets others did not. Those who received says to the others “aah you did not receive a bednet but we received”.. you see that causes fracas and they chase each other, if the two are in classes such that one was eligible and the other not and they share a bed, once there is a misunderstanding the one with a bednet chases the other away” (FGD men, Mtwara Urban)

In an informal conversation with community members, one woman happened to have three school children under her care, two were her biological children and one orphan (from her relative). Coincidentally, both of her biological children received bednets from school but the orphan was not in the targeted class, thus did not receive a bednet. The parents found themselves in a difficult situation when the orphan broke into tears because she/he did not receive a bednet and could not understand the reasons. They had to buy a new bednet for that child.

It was also claimed that the mesh size of the LLINs from the mass distribution was large enough for the mosquitoes to get into the net while an individual sleeps under. For those reasons, some community members decided to use them for other purposes. Quality of the nets was also mentioned as a negative aspect of the school nets, they noted that net material was of low quality and thus short life span.

“And my views are that if you come to give us nets, don't bring those meant for fishing sardines. What I am telling you I mean there are those bednets which were given for free, mosquitoes could get

through. My understanding is that bednets should not permit mosquitoes in. I therefore refer to those as fishing nets, do not give us those, malaria remains.... ” (FGD men, Mtwara Urban)

When they were asked what should be done to improve the program they noted that, school nets should be distributed to all school children without classifications because malaria transmission is not selective. Moreover, participants were asking for more nets to be given because the school nets were not enough to fill the gaps.

“Let them give us more nets some of us do not have, let us all get nets, because some received and some did not, we are not complete that way, all needed to be given nets perhaps we could control malaria” (FGD women, Mtwara Urban)

Moreover they suggested that nets should be according to their preferences thus, mesh size should not be too large to allow mosquitoes in, and size of nets should be six by six. Participant’s views also reflected lack of proper understanding about LLIN, that it is pre-treated and does not need treatment before use. Moreover, they demanded that information about net distribution should be given to parents before net distribution and messages about the issued LLIN should be given direct to the parents instead of informing young children who fail to deliver it as it is.

“Next phase they should not bring those with wide mesh... and if they are not treated with NGAO. Let them be treated first and should be with the long lasting insecticide to last for at least five years. The size should be six by six or six by five it should be known that people sleep on beds of variable sizes”(FGD men, Mtwara Urban)

“We should be given information as parents, with our young children you can tell them something here but forget as soon as they walk out of this room”.(FGD men, Mtwara Urban).

Myth and belief about school nets

Some Focus Group Discussion participants commented that school nets brought bed bugs to the community. Due to this belief, some community members kept the LLINs from the SNP away from their beds. Further, some other respondents associated the red label of school nets with Freemasons signs. They commented that they did not use the nets because they were afraid that nets might have come from Freemason society and they might hurt their children.

*“The new nets which were brought recently, the one you issued recently, they brought bedbugs”
(FGD men, Nachingwea)*

“So it seems there is Freemasons charter, therefore some people are afraid because there are some schools where students were given shoes, but when they put on those shoes their legs get wounds.. Therefore it seems the net also are from Freemason so some people are afraid to use them” (FGD women, Nachingwea)

Stakeholder’s responsibilities and experiences in the distribution of bednets (LLINs)

Training

The distribution process started with training of local leaders, health and education officers at various levels within the districts. From the education sector were district education coordinators, ward education officers, heads of schools and health teachers from each school. From Council Health Management Teams (CHMT), District Medical Officers and malaria focal persons attended training. Participants noted that training messages were mainly about scope of malaria and different malaria control strategies that are implemented at national level. They further mentioned that during training the School Net Programme was elaborately discussed, including registration, eligibility, distribution and messages to be conveyed to the school children. Some stakeholders noted that they were informed about the rationale of targeting only some classes rather than issuing the bednets to all school children.

“Things that we were taught, first of all they taught us the scope of malaria and strategies the government employed to fight against malaria, and amongst them which ones are ongoing”(IDI stakeholder, Mtwara Urban)

“But we were taught how to do registration and how to identify the school children in the classes eligible for the programme and how to issue the nets, we received such training. We were also trained on protection against malaria and how to use a treated net. It was class one, class three, class five and class seven. For secondary schools they said Form four. (IDI school teacher, Mtwara Urban)

“How to identify eligible school children, registration, issuing nets and how to deliver information. They gave economical reasons for giving nets to only selected classes rather than to all school children. They expect to issue nets once every two years meaning that within this year, one phase is completed (IDI, Stakeholder, Mtwara Urban)

“ I remember, I mean at that training they trained us .on how to use a net,..... protection against malaria ...that is all I can remember they informed us on how to keep our environment clean to avoid malaria infection.... use of that net .. how to issue.. about issuing they directed us on how to do the issuing.. they were specific for secondary schools it is form two and form four. For lower levels primary (mmh), they said class one, class three, class five and class seven, without missing (yes).They were saying that (right) then they said we should make sure the net is issued to the targeted child and never to another child on behalf, that can cause an offense” (IDI teacher, Nachingwea)

Teacher’s responsibilities and experiences

School teachers were asked about their responsibilities in school net distribution. Some of the teachers mentioned monitoring class teachers who distribute nets to their students, while some of them reported to have directly issued nets to their students. As per the programme, teachers reported that net issuing went along with message delivery on how the net should be used, handled and who should be the owner of school net in the household level.

“Personally as a health teacher I was involved also as a class master for a class that was eligible for LLINs. My responsibilities during issuing,.....but even before that, I was involved in preparing registers, I distributed note books to all class teachers. After registration, the teachers brought back the registers to me which I kept until the issuing date when I gave them back ready for use in issuing (IDI teacher, Nachingwea)

“My role in the programme was to issue nets and ask one question “did you sleep under a net last night?”. There was a form that we needed to tick for each who slept under a net last night; we were putting a mark as purposed for those who did not sleep under a net. I was verifying only after summing up to get the numbers of those who slept under a net and those who did not” (IDI teacher, Mtwara Urban)

“Amongst my responsibilities was to instruct students the correct use of nets and to advise those who didn’t get net this time that they will get next time “ (IDI teacher, Nachingwea)

Responsibilities and experiences of other stakeholders

Similar to the school I teachers, all other stakeholders in the School Net Programme had responsibilities and tasks to fulfill to make the programme successful. Most of the interviewed high level stakeholders reported that their responsibilities were to coordinate the whole process of net distribution by making sure that teachers were trained, registration was properly done and each school received their bundles of nets accordingly. Ward education officers reported that they followed up distribution process at their respective areas, ensuring that distribution procedures were correctly followed, verified issuing against registers and collected registers after issuing.

“I was involved at all stages: to identify those who would be involved, registration, distribution and how to convey the messages.” (IDI stakeholder, Mtwara Urban)

“I visited each school and made sure that the process involved eligible school children only, another responsibility was to make sure that head teachers and primary school health teachers were committed to their responsibilities in that programme.” (IDI stakeholder, Nachingwea)

While most of the interviewed officers described their roles in the programme with a positive attitude, one top-level officer in one of the two districts criticized the programme for the reason that s/he heard that the programme could not issue bednets to all school children because of limited funds. According to him/her, issuing bednets only to some school children and not all would cause frustration among stake holders and community members.

“I have heard about this programme, my assistants came and told me, it was end of last year. But it is a programme that didn't impress me because of how it was introduced. They came here and told me that they did not have enough money. (IDI stakeholder, Mtwara Urban)

Further, some stakeholders reported that they were not informed and involved in the programme. One of the District Commissioners claimed that her office was not at all informed about the School Net Programme. She added that some community members visited her office to get answers to their questions about the Programme.

Messages delivered to school children

According to the teachers who issued the nets, various messages were delivered to school children during issuing. The messages ought to include, sleeping under a bed net, malaria and its prevention, taking school net to the household and giving to others who had no/fewer nets. The teachers reported that they informed the school children that the net should be washed when it becomes dirty. Another school teacher noted that he/she told the school children that the net should be used and not kept in their bags. Importantly, one mentioned of telling the children that they should hand over the net to the parent/guardian but what the school child had to inform the parent/guardian about that net was not mentioned. “Nevertheless, one teacher reported of having informed the school children about offering the net to a neighbour in case they had enough while the neighbour was in need.

“First of all we were reminding them about malaria transmission and its prevention, also proper ways of using the net, from how to hang on the bed to how to wash the net. We also told them it would be good if they could give the net to their neighbor if their household had excess nets. “ (IDI teacher, Mtwara Urban)

“Amongst my responsibility was to instruct students the correct use of nets and to advise those who didn't get nets this time that they will get next time “ (IDI teacher, Nachingwea)

“The child is informed that s/he should take the net home and give it to the parent or guardian, it should not be sold”. (IDI, teacher Mtwara Urban)

“We told them that the nets were for school children who are the target and they are pre-treated with long lasting insecticide, but also during issuing, I am not sure whether some stored the nets because we informed

them that these nets are for those who do not have nets. If you have a net and you feel you want to give it to another child, then give it to him/her but you also use the net yourself as per instructions, we asked them if they slept under a net in the previous night” (IDI teacher, Mtwara Urban)

“Message to the students was to insist that they should not store the nets but use them and if they had enough nets they could offer it to a neighbour who did not have a net (IDI , teacher Mtwara Urban)

Timing of Delivery

The actual issuing of LLINs in Mtwara and Lindi districts took place during the first week of July in the year 2013. Students had just returned to school from a mid-year break to start a second semester. According to the teachers, days spent for issuing nets varied across schools, some reported to have spent exactly three days as ordered by their administrators while some reported to spend more than three days to accommodate students that reported late to school after the break. Class teachers for the eligible classes were asked to prepare lists based on their attendance registers. Absentees and drop outs were included on the lists. When probed on why they registered absentees and dropouts, they noted that during training they were instructed to register all students. Owing to that, some teachers reported that some few LLINs remained at schools.

“In my school, some few nets remained, for those who didn’t attend school, but I think before we submit the registers some of them might attend classes.” (IDI teacher, Mtwara Urban).

“For some of students who dropped out of school we still have their nets. The nets which we have here belongs to absent students for instance there is one student from standard seven his/her net is here, we don’t understand what will happen” (IDI teacher, Nachingwea).

Boarding schools

Another issue that was explored with individual stakeholders was whether delivering the nets to children in boarding schools was appropriate for getting the net to the household. Few stakeholders were of the view that boarding schools were appropriate to have those children sleep under a net as their right to be protected against malaria like other community members.

“I believe that he/she is part of the community, because if he/she doesn’t have a bednet it means we do not protect her/him against malaria.” (IDI teacher Nachingwea)

However, those who appeared to understand the purpose of the School Net Programme – to deliver the net to the household, perceived boarding schools inappropriate for that purpose mainly due to the timing. Time gap between receipt of the net and next break when school children would go home for holidays was considered too long before the net is delivered to the household.

“For boarding school children, the programme might not be successful, because we issued nets in July when we opened schools, so until December is when we close schools for annual leave. Therefore school nets will be taken home in December when we close schools, it means during all this time other family members who could use that net remain unprotected and thus risk malaria infection” (IDI stakeholder, Nachingwea)

Challenges and Suggestions for improving school net programme.

Few challenges were mentioned by those involved in the delivery and distribution process. In both districts they mentioned that stocks of nets were delivered to the schools during late hours. Most stakeholders in remote areas reported to have received nets from higher authorities during mid night and there was no prior information about nets delivery on that day. Timing of distribution as per school calendar was considered inappropriate by the teachers and they observed that three days were not enough taking into account that schools had just opened after a mid-year break and some students report back to school several days after opening date.

“Those who were supposed to distribute nets tot schools were those people from they were the ones who distributed nets to all schools. They did not send us any information to the extent that they brought nets at midnight (2 AM) and call you to come to your school to receive nets. Therefore such a thing was very disappointing to those who were supposed to receive nets” (IDI stakeholder, Nachingwea)

“The first challenge was late arrival of those who were delivering the nets and it was during teacher’s holidays. The vehicles arrived here late at 1 AM, 2AM by the time all procedures were completed it was already 3 AM (yes) then we started distributing the nets, teachers were contacted by phones and asked to be at their schools early in the morning to wait for us (yes), we reached some points at 7 PM other at 8 PM” (IDI stakeholder, Mtwara Urban)

“Eeeh, there are challenges because when you are told to issues nets for three days (yes) the first week after the student’s mid-year break , most of the school children were not at school during that time and we were told to issue the nets to the student him/herself. And for our case some school children delayed up to two or three weeks especially in secondary schools” (IDI stakeholder, Mtwara urban)

The eligibility criterion was cited as a challenge that stakeholders faced during distribution of the nets. Teachers reported that many parents and guardians of the children who were in the non- eligible classes visited schools to ask for their children’s nets.

“The first challenge is lack of proper understanding of the design by the community, because we issued nets to some children and not all, you get yourself into trouble because they think that you have discriminated against others”. (IDI school teacher, Nachingwea).

Worthy a note: All interviewed students were happy to receive free nets and noted that they took nets to their households. Most of them told their parents that nets belonged to them..

“I told my parents “teachers have given us nets so that we can sleep under it, it is mine, yes” (IDI students, Nachingwea)

Suggestions from the stakeholders in the surveyed districts

Towards the end of interviews with the stakeholders, each was asked to give suggestions on how to improve implementation of the School Net Programme. The following are their suggestions.

- The program should cover all school children and repeat annually
- Information about the programme should be sufficiently communicated to the community and eligibility criteria for receipt of LLIN explained
- Net size of 6" by 6" is preferable for practical reasons
- Training of the implementers should be long enough for proper understanding of the programme
- Consider a possibility of another net programme to target those who are in need of nets especially the most poor

Discussion

Narratives from the community members and officers involved in the implementation of the programme indicated that despite some challenges, the programme was well received and implemented. However, messages about who was supposed to use the issued LLIN were not consistently delivered by the teachers who issued the nets. Due that, children either deliberately or as per messages delivered to them, took the LLINs home but informed the parent that those LLINs were theirs (school children). Possibility of asking the parents to accompany their children on the issuing dates might be worth exploring.

Timing of issue dates should consider school calendars –according to the teachers beginning of a new school term is not the best because some children do not report back immediately after holidays.

Use of secondary school children as vehicles to deliver LLINs to the households has limitations that need to be considered in the implementation of the programme.

Narrations from the stakeholders indicated that the design of the programme was not clearly articulated at that level. While knowledge about eligible classes was high, reasons for targeting were not clear. Lack of clarity among the significant officials at district level can potentially cause unnecessary misunderstanding in the community.

Quality and size of the LLINs appeared as a critical concern among community members, although this is not a new finding but it underscores its importance and the value of the actions that are already in place to address that concern.

Unqualified beliefs associated with use of LLINs among community members have potential to jeopardize the efforts to control malaria in such communities. This merits a need for a detailed qualitative study on this.