

# AN EVALUATION OF THE NMCP/PMI FREE DISTRIBUTION OF THE LLINS TO CHILDREN UNDER FIVE AND NET RETREATMENT CAMPAIGN IN MPANDA DISTRICT, TANZANIA

HOUSEHOLD SURVEY REPORT

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## Table of Contents

AN EVALUATION OF THE NMCP/PMI FREE DISTRIBUTION OF THE LLINS TO CHILDREN UNDER FIVE AND NET RETREATMENT CAMPAIGN IN MPANDA DISTRICT, TANZANIA .....	1
Acknowledgement .....	4
EXECUTIVE SUMMARY .....	4
The main findings.....	5
Background and Rationale .....	6
General objectives .....	7
Specific objectives.....	7
Methodology.....	8
Study area and population:.....	8
Study design:.....	8
Data collection technique and procedures.....	8
Sample size.....	8
Sampling Approach .....	8
Recruitment and Training of field workers .....	9
Quality Assurance .....	9
The field work .....	10
Ethical clearance and informed consent.....	10
Data processing and management .....	10
Results.....	11
Characteristics of the Survey Population.....	11

Household net ownership.....	12
Household net use by socio economic status.....	13
Household net use by age groups.....	14
Duration of net ownership in the household .....	14
Source of nets owned by households.....	15
Months of the year to put up bed nets in the villages.....	16
Children under five sleeping under net .....	16
Household net retreatment during campaign .....	17
Registration of children < 5 years for free LLINs.....	17
Use of free distributed LLIN by children under five in the household.....	18
Time spent by mothers travelling to attend the free LLIN distribution campaign .....	19
Source of information about free LLINs and net retreatment campaign.....	19
Hanging of received free LLINs and mothers knowledge .....	20
Discussion.....	20
Household net ownership after free net distribution campaign.....	21
Household ITN ownership and use after free net distribution campaign .....	21
Registration of children < 5 years for free LLINs.....	22
Household net retreatment campaign .....	23
Time spent by mothers travelling to attend the free LLIN campaign .....	23
Conclusion.....	23
References .....	24

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## ***EXECUTIVE SUMMARY***

### **Introduction**

The National Malaria Control Program (NMCP) in collaboration with the PMI launched a free distribution of LLINs to children under five years and re-treatment campaign through a community based approach in Mpanda district in October 2008. in Mpanda district in October 2008. One month after the campaign we a house hold survey in order to assess its impact on increasing ITN coverage and use among children under five. This evaluation also aimed at identifying challenges and best practices for duplication of the same to other districts or for large coverage. A total of 297 households were involved in the survey and of them 193 (65%) had children less than five years of age. About 302 children under five years were involved in the reported survey.

## The main findings

- 85.42% of the surveyed households reported having of any net and 75.6% of them are less than 24 months old. The mean number of nets per household is 2 and the mean number of sleeping spaces is 2
- Free distribution contributed to 51.6% of nets owned by households and ranked number one source of nets followed by a purchase from shops 41.8%
- The proportion of treated nets in the households was 49.8%
- Common months in the year when bed nets are put up are December to May.
- Proportion of children < 5yrs in households owning treated nets 49.1%
- 56.3% of children under five children slept under any net a night before the survey where among them 44.2% slept under treated nets, 7.3% slept under untreated nets. 43.7% of this age category did not sleep under any net during this period.
- Proportion of children < 5 yrs registered for free LLIN 44.2%. Of the under five children it's only 35% who received the LLINs.
- 56.8% of the free LLINs nets were reported to be in use either by the child alone or sharing with another household member, whereas 32.6% of free LLINs were still kept for future use.
- 62.8% of households with children under five were registered for net re-treatment but only 18.5% of mothers from registered households brought nets for re-treatment
- 88% of the registrations took place at household
- In 67.5% of mothers local government was the main source of information for the exact dates of the campaign
- 49% of the caretakers used more than 3 hours going to a free LLINs distribution points. Additionally 56.7% of all caretakers spent more than 3 hours waiting to be served at the distribution points

**Conclusion:** Free net distribution campaign has contributed to 51.8% of nets owned by the households in the surveyed areas. Also it has contributed to 93% of treated nets found in the households in general. One month post free LLIN distribution and net re-treatment campaign ITN coverage in children underfive is 49% and the proportion of children underfive sleeping under ITN is 44% in Mpanda district. About 30% of free LLINs were still unused but kept for future use probably because the preferred period for using nets in Mpanda is from December to May following

long rains. Olyset nets distributed during the campaign constitute 77% of treated nets used by children under five. However, the registration of children under-five to receive free LLIN was lower than expected, only slightly less than half (44%) of children under-five were registered and received LLINs. On the other hand net re-treatment did not contribute much to the number of treated nets in the households despite a relatively high registration rate of 62.8% of households for net re-treatment. Many mothers approximately 50% of those who attended a free net campaign spent too much time three hours or more going to the distribution point and waiting to get services. Generally the campaign had some significant impact in raising ITN coverage in children under-five and in the general population as a whole in Mpanda district. However, our results suggest that with more careful planning from registration to distribution stage a lot more can be achieved through a new community based approach campaign like this.

### ***Background and Rationale***

Insecticide Treated Nets (ITNs) are a proven intervention for malaria control (1). In this context ITNs we define ITN as either an ordinary net treated with ordinary insecticide within 12 months of the survey date, or ordinary net ever-treated with longer-lasting insecticide or long lasting insecticidal net (LLINs). In Tanzania where malaria transmission is generally endemic, the government's goal in relation to an end to malaria is similar to those of global health frameworks such as Roll Back Malaria initiative (RBM), Millennium development Goals (MDGs) for health and United States President's Malaria Initiative (PMI) (2-4). ITN has been identified as an essential preventive strategy for achieving this goal. And all the three frameworks target not less than 80% net use for under-fives and pregnant women by 2010. They are highest at risk of malaria morbidity and mortality and the success of any malaria control intervention is measured in terms of reducing or ending transmission to these two groups.

Multiple ITN delivery measures are implemented in the country to ensure that this important coverage is achieved. These measures include partnership involving public and private sectors as it was successfully tested by Ifakara Health Institute (IHI) in Kilombero and Ulanga districts, southern Tanzania (5). The program involved massive targeted subsidies was able to increase ITN coverage of infants from 10% at baseline to 50% over three years. Similar strategy was adopted by the National Malaria Control program, Tanzania (NMCP) since November 2004 it has been implementing a national targeted subsidy scheme known as "Hati Punguzo" for bednets on roll out basis by May 2006 reached the entire country. The subsidy is in the form of a discount voucher and targets pregnant women and infants attending clinic care with discount vouchers that could be redeemed in part payment for bednets throughout the country. Through a special project voucher, the NMCP is subsidizing Long Lasting Insecticide Treated Nets (LLITNs) for under-five children in the county.

Free distribution of ITNs is another approach of gaining increased coverage to vulnerable groups such as children under five. In 2006 an integrated child health campaign with free distribution of 162,254 untreated bed nets bundled

with insecticide, measles vaccination, vitamin A, and mebendazole for children under 5 was conducted in Lindi Region, Tanzania. A household survey conducted three months after the campaign showed that in households with under-5s possession of bed nets and ITNs increased from 60.9% to 90.7% and from 16.5% to 37.3% respectively. Increases occurred in all wealth quintiles and equity improved. Reported bed net and ITN use the previous night among under-5s was 46.3% and 21.5%, respectively. Results from this campaign show that integrated campaigns rapidly and equitably increase bed net possession and use meriting continued large scale implementation (6).

In October 2008 the National Malaria Control Program (NMCP) in collaboration with the US Presidential Malaria Initiative (PMI) conducted a free distribution campaign of LLINs to children under five in Mpanda district. This campaign was accompanied with a mass retreatment of old nets. The free LLINs distribution and retreatment campaign was preceded by community awareness meetings and child registration few months before. The distribution of LLINs was conducted in every village in two consecutive days.

Three weeks after the campaign the NMCP and PMI evaluated the success of the LLINs campaign in increasing ITN coverage and use by children under five, and also identify the challenges for free distribution of ITNs in the community. Ifakara Health Institute (IHI) based on her experiences in conducting program evaluation activities was commissioned to carry over this evaluation on behalf of NMCP and PMI. IHI is a research institution affiliated to the National Institute for medical Research, Tanzania (NIMR). The main mission of IHI is to develop and sustain a district based health research and resource centre capable of generating new knowledge and relevant information for public health policy and actions. Several key achievements, over the last 15 years, have confirmed the IHI's international reputation of an institution capable of conducting population-based research. Preliminary findings were presented to the ITN cell in the National Malaria Control Programme and to the NATNET partners on 14<sup>th</sup> January 2009. None of the findings presented here are different in substance from the preliminary results, however, there have been some minor changes and corrections (e.g. in confidence intervals) arising from subsequent data cleaning. For this reason, the results in this report supersede those in previous presentations.

### ***General objectives***

To evaluate the impact of free distribution of LLINs campaign in increasing net coverage and use among children under five in Mpanda district and identify major challenges in order to guide future implementation of LLINs free distribution campaigns

### **Specific objectives**

1. To estimate the coverage of ITNs to children under five years post free LLINs distribution campaign
2. To determine how the ITNs coverage vary by: socioeconomic and demographic characteristics.

3. To estimate the proportion of nets treated/re-treated in the community

## ***Methodology***

**Study area and population:** This survey was conducted in Mpanda district. The target population included 297 households in selected enumeration areas.

**Study design:** This was a cross sectional study employing quantitative research methods.

## **Data collection technique and procedures**

A structured questionnaire programmed into PDA was administered to all respondents. This technique was chosen based on its high standard for collecting quantitative data and also we felt that most objectives of this study will be met by using this method. The questionnaire had two modules, first included household module where collected information on the household about Identifiers, all residents, assets (markers of socioeconomic status), education and occupation of the household residents. The module also included data on household registration for LLINs, awareness on the campaign, household head attendance on free mass net re-treatment and net ownership/use of net/ITN by all household members including the U5s

In module two, which was administered by child care taker captured information to each under five recruited in the survey. The data collected for the child included child registration for free LLINs, child net/LLINs use including type of net in use and child net re-treatment

## ***Sample size***

Based on WHO recommendation for MATERNAL AND CHILD HEALTH DELIVERY CHANNEL SURVEYS, using indicator of “slept under a bed net last night” , it is required to visit 224 households with 168 under-five children. However, for comparability with other previous surveys on ITN coverage done by the Tanzania National Voucher Scheme (TNVS), a total of 297 households were visited among these 282 households had children under five years of age and a total of 302 under five children were seen.

## **Sampling Approach**

EPI sampling method was used, that is samples of clusters were selected from a list of all clusters using Probability Proportion to Size (PPS). This required a creation of source database consisting of name and size of each cluster in the sampled population. The sampling selection was done using CSurvey program software for IBM-compatible microcomputers that selects a cluster sample from a list of clusters. In this survey, the procedure involved multi-stage sampling method starting with selection of the 658 enumeration areas (EAs) of Mpanda district from the National Bureau of Statistics (NBS) followed by a selection of visited households. Based on Census 2002 data, Mpanda

district has 5.6 populations per household and 15% of under-five children. We selected 30 enumeration areas and in each enumeration area (EA), 10 households were randomly selected. In cases of repeated absence or refusal to participate there was no substitution. All non-participating households were verified by the supervisor. The households were obtained with the use of EPI recommendation whereby on arrival and in consultation with the local leadership the research team went to the centre of the hamlet and throw a pen for choosing random direction.

### **Recruitment and Training of field workers**

Field workers including interviewers and field supervisors with basic experience on household surveys were identified and recruited by senior IHI research scientists who were assigned to this survey. The survey field team included ten interviewers, two team leaders and one overall field supervisor. Each interviewer was responsible for interviewing 4-5 households each day. Supervisors assisted with household selection and introducing the work to village leaders, accompany a few interviews each day and re-interview a random 5% of all households

Principal investigator was on full-time basis for coordinating and managing the survey. Three research scientists were appointed on part-time basis on consultative work and support the principal investigator and devoted 50% of their time to this assignment. Training of the teams was done for three days period at IHI premises, from 19<sup>th</sup> to 21<sup>st</sup> November, 2008. The training consisted of introducing the purpose and context of the survey and the survey tools. The participants were taken through each module comprehensively. This was followed by extensive role-plays among the interviewers. Principles and strategies for successful interviews were discussed. The importance of quality data was made very central to the training.

Supervisors were later trained on household sampling, accompanying interviews and maintaining quality checks continuously including revisit to all 'empty' households. Also the supervisors were trained on performing daily synchronization of PDA's back-up of data to a CD while they were in the field

### ***Quality Assurance***

IHI places high priority on the quality of its output, and thus, quality assurance was an integral part of this assignment. Quality was assured through four basic exertions. First, recruitment of survey enumerators and interviewers was made to ensure that only qualified and experienced people were recruited.

Secondly, effective training of supervisors, enumerators and interviews was conducted to ensure a detailed understanding of the study objectives, process, and output requirements for consistency and completeness

Thirdly, close supervision of fieldwork by senior researchers and field supervisors was made to ensure that enumerators and interviewers collected data coherently and in a manner that maintained data integrity and completeness. Each enumerator and interviewer checked all the data collected on a daily basis before being inspected and approved by field supervisors. Lastly, senior researchers reviewed the study instruments on a sample basis as the study was progressing. Continuous monitoring through telephone communication between field supervisors and research assistants was made to ensure that obstacles were quickly resolved and fieldwork progressed within the planned time frame.

### **The field work**

Prior to the survey, the district, ward and village authorities were informed and asked for their support. Within selected households, the study was explained to the household head, and his/her consent sought. With the support of authorities at all levels, the actual data collection exercise for the survey was done in Mpanda district from 22<sup>nd</sup> November to 5<sup>th</sup> December 2008, these included 6 travel days.

Two teams each composing of one supervisor and five interviewers carried out this study. Each interviewer carried personal digital assistant (a small, hand-held computer) for data collection. Each supervisor carried one laptop computer so that data from each day could be downloaded from the PDAs and written to a CD. The general field supervisor oversees all the field work activities and was moving with each team interchangeably to the field. Additionally, close contact between IHI headquarters and the teams was maintained through cell phones.

### ***Ethical clearance and informed consent***

This study sought ethical clearance from IHI Institutional Review Board. A detailed information sheet about this study was drawn up in Swahili, explaining among other things the purpose of the survey, the institution that was executing it and confidentiality of the information gathered. Respondents were encouraged to ask any question for further clarification whenever needed. Written consent of all respondents was obtained before proceeding with interview. The consent was sought from the household heads or appointed representative). Confidentiality of all study participants was assured

### ***Data processing and management***

All data were entered into handheld computers at the point of data collection in the field. Data cleaning was undertaken by the information technology expert at IHI Data unit using information from the Data Error Forms, supervisor summary forms, daily access-generated reports and standard range and consistency checks.

Data were analyzed using Stata software according to the analytical plan. The “svy” commands were used to allow the confidence intervals estimated on parameters adjusted for the cluster structure of the survey. Socio-economic status was assessed by constructing a household “wealth index” based on household asset ownership by using the

Principal Component Analysis (PCA). The assets included: radio, mobile phone, and bicycle and housing conditions- type of toilet, whether connected to electricity supply, and type of roof. Based on the constructed index, households were classified into wealth quintiles, rated as poorest, poor, and least poor. All the variables were entered as binary (0-1) variables summary measures included means and medians.

## **Results**

The household survey to evaluate the impact of free distribution of LLINs and net re-treatment campaign in increasing net coverage and use among children under five in Mpanda district and identify major challenges was carried between 22<sup>nd</sup> November and 5<sup>th</sup> December 2008. This period was approximately one month post campaign. A total of 297 households were surveyed, out of them 193/297 (65%) households had children under-five. Out of 193 households with children underfive 215 mothers/caretakers were interviewed.

### **Characteristics of the Survey Population**

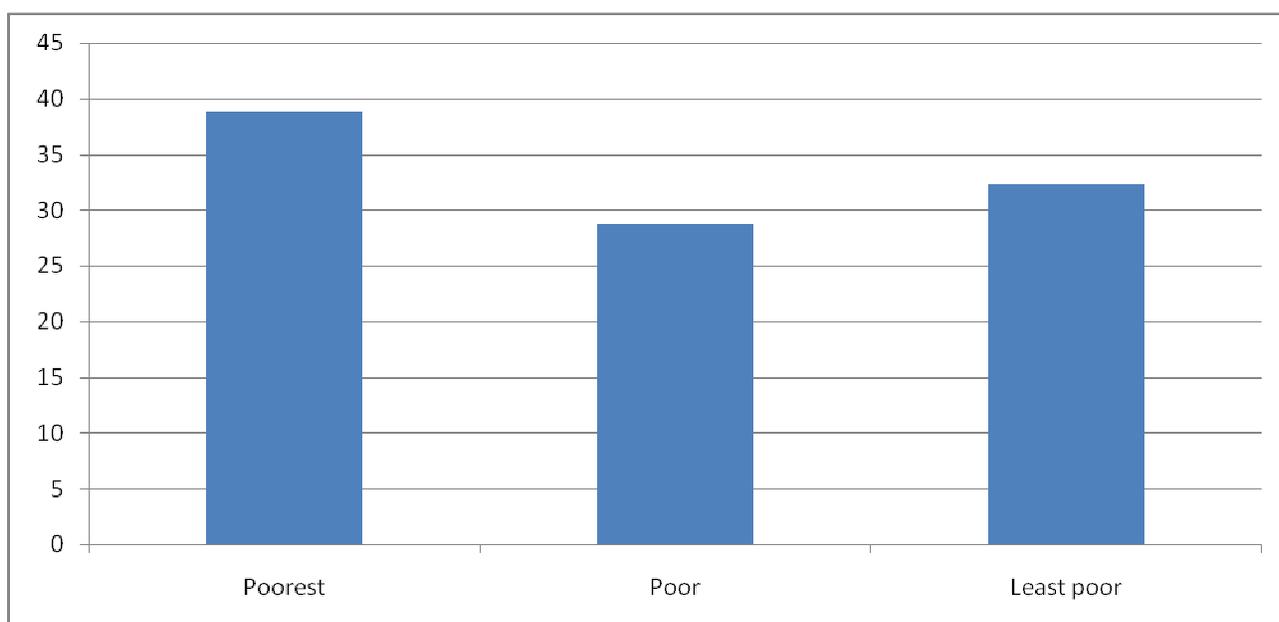
Table 1 below shows a total of 297 households with a total population of 1,323 people among them 302 (22.8%) being children under five were involved in the survey. Of the surveyed households 193 had children under five, the mean household size was 5 people while the mean number of sleeping places in households was 2.

**Table 1: General characteristics of the survey population**

Total number of households	297
Total number of people in households	1,323
Total number of children underfive	302
Total number of households with children underfive	193
Mean household size (number of people)	5
Mean number of sleeping places	2
Mean number of nets per household was2	2

Figure 1 below shows that most of the households approximately 40% fall within the poorest socioeconomic quintile

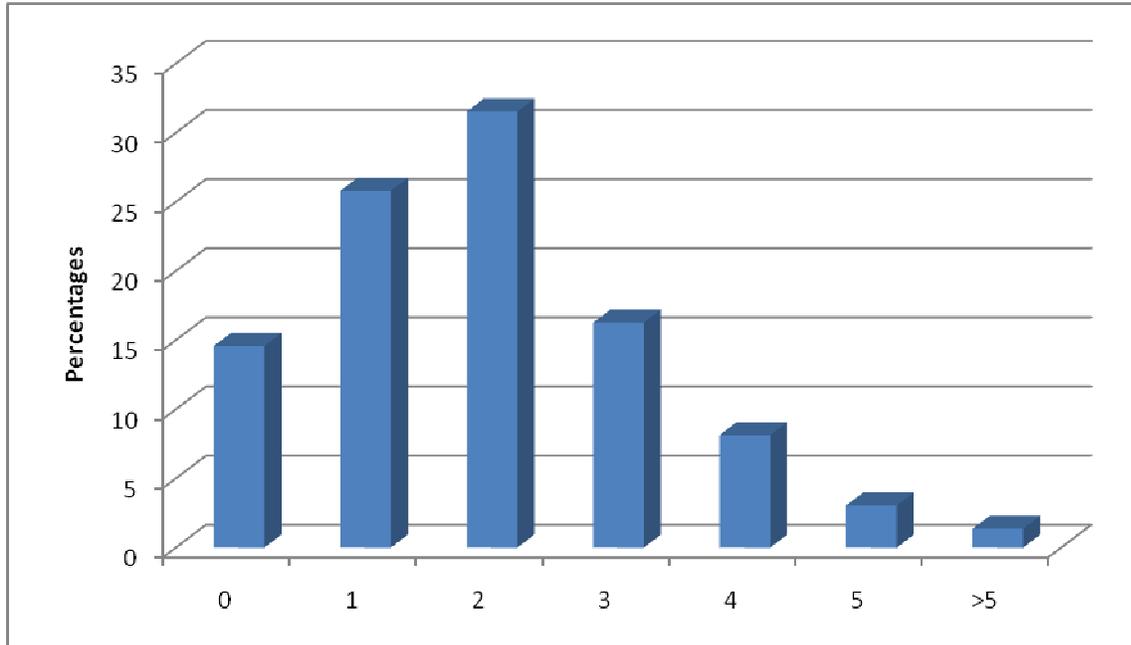
**Fig 1: Households Socio Economic Status**



### **Household net ownership**

The study explored the ownership of nets in the households. Figure 2 below shows that majority (85.42%) of households reported having of any net. A total of 594 nets were reported of which 445 (75%) were physically confirmed during the survey. Most of the households (31.53%) reported to own 2 nets. Very few (1.36%) households who had more than 5 nets.

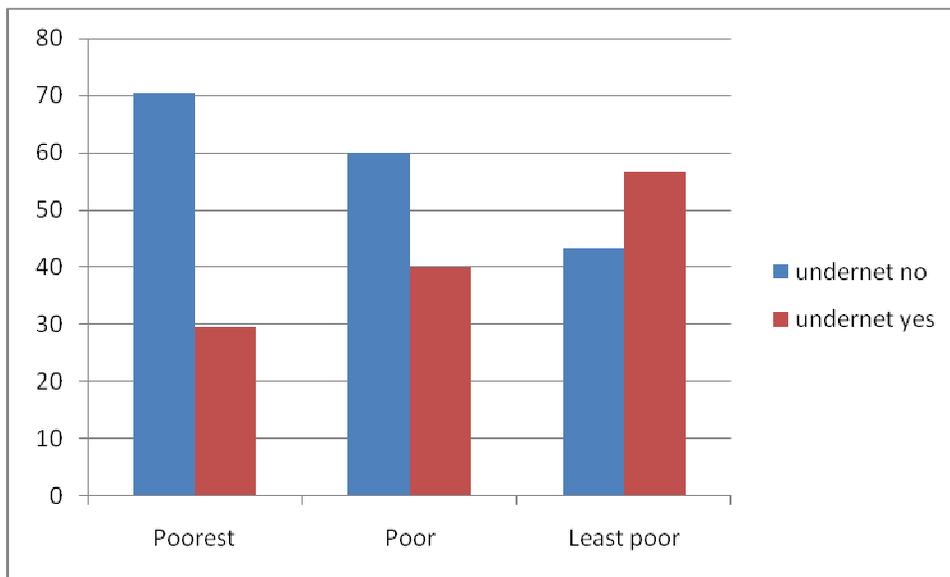
**Fig 2: Household net ownerships**



### **Household net use by socio economic status**

In this study we compared household net use between different socio-economic groups as presented in figure 3 below. It implied that net use is higher for least poor households than the poorest households.

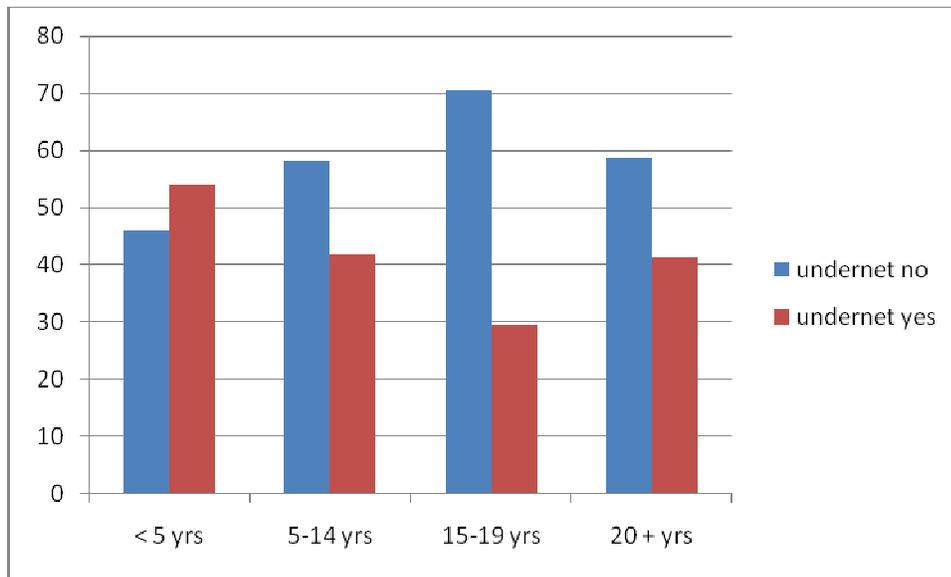
**Fig 3. Sleeping under net by Socio economic quintiles**



## Household net use by age groups

Figure 4 below shows that overall 47.6% of the study population in the surveyed households is sleeping under any net. Net use was higher in children under five group category (53.89%) as compared to other age categories in the survey district

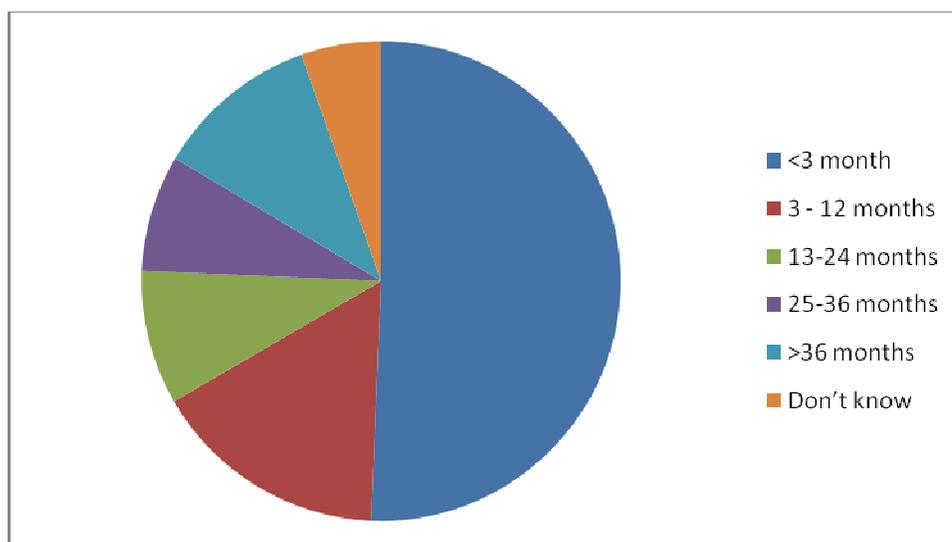
**Fig 4: Proportion of Household members sleeping under any net by age group**



## Duration of net ownership in the household

In order to establish the relationship between nets owned by the households and the LLINs free nets campaign the survey solicited information of the time when the nets were acquired. Half of the nets are reported to be obtained in a period of less than 3 months preceding the survey see figure 5 below. This time frame lies within the period when the Ministry of Health and PMI launched the free LLIN campaign in the district. Fig 5 shows that most of the nets owned by the surveyed population were obtained during the free LLINs campaign

**Fig. 5: Duration when a household acquired the nets**



### Source of nets owned by households

It was not enough to assess only the duration when the household nets were obtained for us to determine the contribution of LLINs free nets campaign to the nets owned by the households in the district. In addition, we decided to observe the sources of the nets owned. Free nets ranked highest (51.6%) in terms of where the household nets were obtained followed by purchase from shops (41.8%). Subsidized vouchers for infants and pregnant women contributed to 5.4% of nets in the household (see table 2). Majority of the treated nets (93%) found in households were obtained from the free net campaign one month prior the survey. Proportion of children < 5yrs owning treated nets in the households were 49%. One of the places reported for obtaining the free nets owned by the households are the centers that were set and used by the ministry of health and PMI for net retreatment and distribution during the free LLINs campaign.

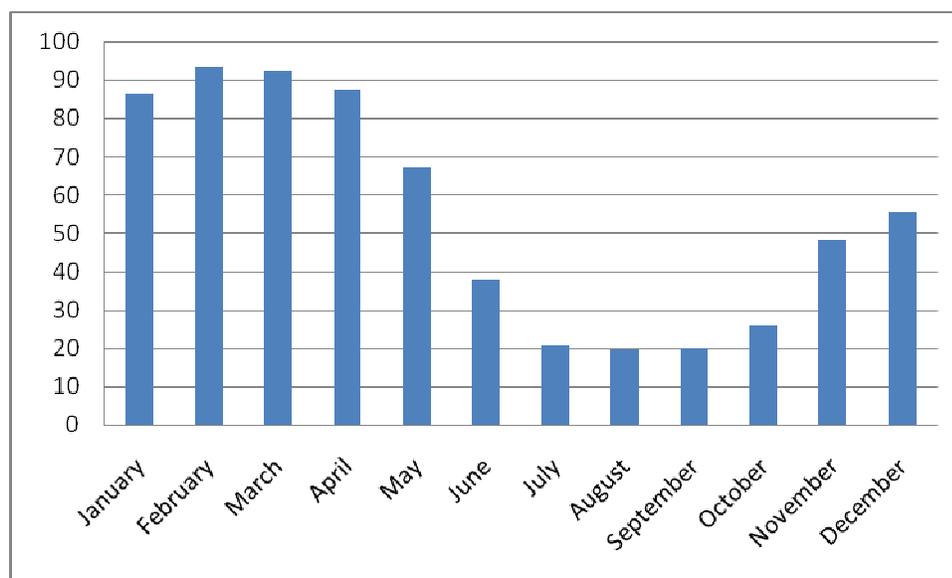
**Table 2. Households net ownership in relationship to free net distribution and re-treatment campaign**

	Number	Percentage	95% C.I
Total number of nets in households	594		
Mosquito nets witnessed during survey	445/594	74.66	71.42971 78.40194
Proportion of treated nets in households	294/594	49.8	45.47424 53.51566
Proportion of treated nets in households from free net campaign	274/294	93	90.3191 96.07546
Main source of nets in households			
- Free nets	308/594	51.85	47.8337 55.87001
- Shop	244/594	41.08	37.12107 45.03382
- Hp	32/594	5.39	3.57164 7.20277
Proportion of free nets in households used by children < 5yrs	136/274	49.6	43.71491 55.55517

## Months of the year to put up bed nets in the villages

Figure 6 below shows the preferred months by villagers to put up bednets. The preferred months are mainly December to May when more than 50% of people prefer to put up nets. The rest of the months from June to November it is less than 30% of people in most cases who prefer to put up nets.

**Fig 6: Months to put up bed nets in the village**



## Children under five sleeping under net

Table 3 below describes children under five net use in the surveyed households. We have used WHO standard for classification of a treated net. A treated net is any net with long lasting insecticide treatment or nets treated with conventional insecticide for the last 12 months. By virtue of being treated at the factory with long lasting insecticide, Olyset Nets, are considered insecticidal by this definition. Results in table 3 suggest that generally 56.3% of children under five slept under net the night before the survey. Children under five sleeping under a treated net (ITN) the night before the survey were 44%. The proportion of children sleeping under untreated net was 7.3%, while those not sleeping under any net were 43.7%. Among the ITNs used by under five 114 (77%) were olyset nets.

**Table 3: Net use by children under five**

	Number	Percentage	95% confidence interval
Proportion of children < 5yrs owning treated nets in households	148/302	49.01	43.36857 54.64467
Proportion of children < 5yrs sleeping under any net	170/302	56.29	50.69705 61.88573
Proportion of children < 5 yrs sleeping under ITN night before	95/215	44.19	37.54796 50.82413

Proportion of children sleeping under untreated net	22/302	7.3	4.35369	10.21585
Number of children < 5yrs not sleeping under any net	132/302	43.71	38.11427	49.30295

### Household net retreatment during campaign

The survey also explored information on household net retreatment practices and results show 49.8% of the nets owned by the households are reported to be treated. It was reported that 20.4% (56/274) of treated nets in the households in general were re-treated during the campaign. However, majority 52.3% of the respondents were unable to recite the period when the nets were retreated. Results show that among mothers with children under five only 62.8% of their households were registered for net re-treatment. Those households that were registered for net re-treatment 93% were provided with registration card for each respective net. However, it is only 18.5% of registered houses that brought nets for re-treatment, and majority 80% brought only one net. Most mothers 68% said they were informed prior the campaign about bringing old nets for re-treatment, and very few 7% were afraid to bring old nets for re-treatment for fear of not getting a new one. For the mothers who brought nets for re-treatment most of them 80% re-treatment was done for them by someone else at the net distribution point.

**Table 4: Household net retreatment and mothers experience in implementing the re-treatment campaign**

Mothers who their households were registered for net re-treatment	135/215	62.8	56.32966	69.25174
Mothers from registered households who the registration card was provided for each respective net	126/135	93.3	89.12554	97.54112
Mothers from registered households who brought nets for re-treatment	25/135	18.5	11.96592	25.07112
Number of nets brought for retreatment per household				
- 1				
- 2	20/25	80	64.32029	95.67971
- 3	4/25	16	16.2931	30.37069
	1/25	4	0.68146	11.68146
Person re-treating the net brought by mothers				
- Mother herself	4/25	16	1.62931	30.37069
- Another person at re-treatment point	21/25	84	69.62931	98.37069
Mothers who did hear about free LLIN campaign and knew about bringing old nets for retreatment	136/200	68.00	61.53509	74.46491
Mothers who knew about the campaign but were afraid to bring old nets for re-treatment	14/200	7.00	3.46391	10.53609

### Registration of children < 5 years for free LLINs

Despite of the high (93%) awareness of the under five free LLINs campaign observed among the mothers/caretakers in the households results show that only 44% of eligible children were registered to receive free LLIN. Most (97.25%)

of those who registered reported to have done so several days before the campaign. Most of the mothers (78.9%) who registered for free LLIN received free LLINs during the campaign. Among the mothers or caretakers who attended the free net distribution campaign only 27.4% took free LLINs for their own households and 7.4% took free LLINs for children of other households. A total of 139 free LLINs were received by mothers/caretakers who attended the campaign for children under five. Most of the mothers 60% received 1 net only and a few received two or three. The proportion of free LLINs given to children under five during the campaign is 50.7% of all free treated nets reported in the households in general that were obtained during the same period of the campaign prior the survey (See table 5).

**Table 5: Registration of children < 5 yrs for free LLINs distribution campaign**

	<b>Number</b>	<b>Percentage</b>	<b>95% C.I</b>
Mothers who did hear about free LLIN campaign	200/215	93.02	89.61799 96.42852
Mothers who their children were registered to receive free LLIN	95/215	44.19	37.54796 50.82413
Mothers of registered children under five who received free LLIN	75/95	78.95	70.74936 87.14538
Mothers who received free LLINs for their own households	37/135	27.4	19.88319 34.93162
Mothers who received free LLINs for registered children of other households not their own	10/135	7.4	2.98964 11.82517
Proportion of free LLINs received during campaign for children < 5 out of all free nets obtained during same period found in all surveyed households	139/274	50.7	44.81027 56.64958

### **Use of free distributed LLIN by children under five in the household**

Data in table 6 show that a total of 54/95 (56.8%) of the free distributed LLINs were used by the targeted child under five either alone or sharing with another person in the household the previous night. Only 10/95 (10.5%) of the free distributed LLITNs were used by someone else, while 31/95 (32.6%) no one used them.

**Table 6: Use of free LLINs by children under five**

	<b>Number</b>	<b>Percentage</b>	<b>95% C.I</b>
Slept under LLIN - not the registered child	10/95	10.5	4.35508 16.69755
Slept under LLIN – registered child alone	9/95	9.5	3.5848 15.36257
Slept under LLIN – registered child and other member	45/95	47.3	37.32795 57.40889
Slept under LLIN – No one	31/95	32.6	23.20328 42.05988

## Time spent by mothers travelling to attend the free LLIN distribution campaign

Data on table 7 show in 62.7% of cases mothers/ care takers were the ones who attended the free net distribution campaign. However in 30.7% of cases representatives attended the campaign instead of the mother. Most of the respondents (49%) used at least three hours for just moving to a service delivery point. On the other hand, 56.7% reported to spend about 3 hours or more at the service delivery points waiting to be attended or getting the service.

**Table 7: Time spent by mothers at the free LLIN and net re-treatment campaign**

Person attended the free net campaign				
- Mother/caretaker	134/215	62.3	55.84841	68.80275
- Representative	66/215	30.7	24.53236	36.86299
Time spent travelling to the net distribution point				
- Less than 1 hour	63/134	47	38.56427	55.46558
- Between 1 hour and 3 hours	5/134	4	0.52234	06.94035
- 3 hours and more	66/134	49	40.78892	57.71854
Time spent waiting at the distribution point to be attended				
- Less than 1 hour	41/134	30.60	22.79469	38.39934
- Between 1 hour and 3 hours	17/134	12.69	07.05138	18.32175
- 3 hours and above	76/134	56.71	33.44017	50.14192

## Source of information about free LLINs and net retreatment campaign

Study participants with children under five were asked from which source they got the information about free LLIN and net re-treatment campaign. Respondents reported to have heard of the exact dates of the campaign from different sources. However, the local government 67.5% was the main source of information, followed by neighbor/relatives 35.5%, and other sources such as public gatherings in 30.5% (See table 8).

**Table 8: Source of information**

	Number	Percentage	95% C.I
Source of exact date and place – local government	135/200	67.5	61.00878 73.99122
Source of exact date and place – neighbor/relative	71/200	35.5	28.86827 42.13173
Source of exact date and place – others e.g gatherings	61/200	30.5	24.1192 36.8808

## Hangings of received free LLINs and mothers knowledge

Data on table 8 show among the mothers of children under five who received free LLINs, only one third (33.58%) already hanged up the net at the time the survey took place. We observed that though majority (87.31%) of mothers did not receive information on how to hang the nets, but most of them (94.35%) already knew how to hang the net even before the campaign. We went further into examining why most of the distributed nets are not yet hang. Keeping the net for future use was the most frequently 84/89 (94.38%) mentioned reason for not hanging the net. Other reasons of not hanging net were using the net for other purpose, net was sold, and lack of adequate space for hanging the net. Very few mothers (25.37%) were informed that the nets provided during the campaign do not need re-treatment, and very few (20%) knew the difference between ordinary nets and Olyset nets.

**Table 9: Hanging of received free LLIN and mothers' knowledge about Olyset nets**

	Number	Percentage	95% C.I	
Mothers who received instructions on how to hang the LLIN	17/134	12.69	7.05138	18.32175
Mothers who had already hanged the new LLIN	45/134	33.58	23.27412	41.43176
Mothers knew how to hang a net before getting the new LLIN	117/134	94.35	81.67825	92.94862
Reasons for not hanging the net				
- Room not adequate to hang the net	1/89	1.2	0.9317	2.89248
- Sold the net	2/89	2.25	0.7299	04.65147
- Using the net for other purposes	2/89	2.25	0.7299	04.65147
- Kept the net for future use	84/89	94.38	51.30943	70.25919
Proportion of mothers who were informed that the nets provided during the campaign do not need re-treatment	34/134	25.37	18.00546	32.74081
Proportion of mothers who know the difference between ordinary net and Olyset	43/215	20	14.65326	25.34674

## Discussion

The government and other partners including Roll Back Malaria initiative (RBM), Millennium Development Goals (MDGs) for health and United States President's Malaria Initiative (PMI) goal is to increase ITN coverage and use to 80% in children under five and pregnant women the high risk groups by 2010. This goal is still far off to be reached in most of the African countries south of Sahara. Our study findings show how much the campaign has contributed in increasing ITN coverage among children under five, and also shows the challenges of implementing free net

distribution campaign at the community level that need to be addressed when rolling out to the rest of the districts in the country. Below are few areas of concern

### **Household net ownership after free net distribution campaign**

In our survey population the mean household size was five people, while the mean number of sleeping places and the mean number of nets per household was two. Most of the households approximately fall within the poorest socioeconomic quintile and results show net ownership and use is higher for least poor households than the poorest households. Generally it was shown that the proportion of people sleeping under any net in the household was higher in children under five (53.9%) compared to other agegroups. With this kind of socio-economic status it is expected that interventions such as free ITNs given to children under five are more likely to be shared also with other household members not initially targeted.

Most of the nets 75.6% owned by households are less than 24 months old and therefore expected to be still in good physical condition. The main source of nets were free net distribution contributing to 51.6% of the nets owned by households and were reported to be obtained in a period coinciding with the free net distribution campaign. Purchase from shops contributes to 41.8%, whereas both pregnancy and infant vouchers contributes to only 5.3% of the total nets owned by household. These results suggest that the recently conducted free net distribution campaign had a significant impact in improving net ownership in Mpanda district. The results also suggest that applying together multiple methods to deliver ITNs is a better approach than a single method alone in order to raise ITN coverage to a desired level.

### **Household ITN ownership and use after free net distribution campaign**

One month post free net distribution and re-treatment campaign the proportion of treated nets in the households was almost 50%, and a big majority 93% of these was obtained through the free net distribution campaign. Approximately 50% of treated nets mainly obtained from free net campaign were being used by children under five. Even without the baseline data on ITN coverage in Mpanda district, still these results suggest that the recently conducted campaign has contributed a lot to the observed ITN ownership in the households in Mpanda district.

Also our study shows that generally 56.3% of children underfive sleep under any net, and the proportion of children under five owning ITNS is 49% while those who slept under ITN the night before the survey was 44%. Most of the ITNs (77%) that are used by children underfive are olyset nets. The proportion of children sleeping under untreated net one month post campaign is 7.3%, and there is still a good proportion (43.7%) of children under five not sleeping under any net. We do not know what the ITN coverage in children under five was before the campaign, but taking into consideration that about 50% of ITNs used by households were acquired through the free net distribution

campaign then it is suggestive that the observed ITN coverage is as a result of free net distribution campaign to children under five.

The results of this study are similar to those from the integrated child health campaign with free distribution of untreated bednets bundled with insecticide which was carried out in Lindi region 2005. The survey which was carried out three months later after the campaign revealed there was an increase in ITN coverage from 16.5% to 37.3%. Reported use of ITN the previous night among under fives was 21.5% (6).

The use of freely distributed nets by children under five is another area of concern in many developing countries. In our study 56.8% of the mothers reported that the free LLINs distributed in the last campaign were being used by children under five either alone or by sharing with another household member and 10.5% of the mothers reported the LLINs were used by another person and not the targeted child. However, quite a good proportion of mothers 32.6% reported that LLINs were kept waiting to be used later. Same applies with hanging of the LLIN, only 34% of mothers had their nets hanged at the time of the survey and majority of those who did not hang their LLINs the main reason was that they were keeping them to be used later. The main reason of keeping the LLINs for future use could be because the months of October and November are not the preferred months for putting up nets by about 75% of people in Mpanda villages as it was shown in figure 6. Our data show that the preferred period for hanging nets and sleeping under them is between December and May when more than 50% of people put up nets and the survey was done in November and ended at the beginning of the first week of December. The period December to May coincides with the season of long rains in most parts of the country. Therefore LLINs that were kept for use later could be waiting for this particular period which is usually accompanied by high mosquito population.

### **Registration of children < 5 years for free LLINs**

Most mothers 93% were aware of the under five free LLINs campaign, however, only 44% of eligible children were registered to receive free LLIN and 97% of those who were registered reported to have done so several days before the campaign. It is not clear why only 44% of children under five were registered it would be a good idea if further investigation would be made to identify the reasons why so as to help with future implementation. Our data show 79% of mothers who registered for free LLIN received free LLINs during the campaign, and most of them took LLINs for their households but also a few took LLINs for other households not their own. This study also shows LLINs given to children under five during the campaign contributes to 50.7% of all free nets obtained during the same period of the campaign that were found in households in general.

Registration took place mostly at home in 91.6% of cases and in some few instances registration took place at village government office, neighbor and at the distribution center on the very day of distribution campaign. Most of the respondents 78% could remember registration took off between the months of September and October, whereas about 17.4% could not recall when it took place. The main source of information on the exact day and place of the campaign was from the local government 67.5%, neighbours and relatives 35.5% and then other sources including public gatherings 30%. Television and radios did not play any significant role as a source of information for this rural community.

### **Household net retreatment campaign**

Our study shows that approximately 20.4% of treated nets in the households in general were re-treated during the campaign, however, majority 52.3% of the respondents were unable to recite the period when the nets were retreated. Among mothers with children underfive only 62.8% of their households were registered for net re-treatment and 93% of the registered households were provided with registration card for each respective net. Out of all the registered households it is only 18.5% that brought nets for re-treatment, and majority 80% brought only one net. If all the registered nets were brought for re-treatment majority of the untreated nets found in households would have been treated and hence raising ITN coverage. It is not clear why only few people managed to bring nets for re-treatment. Only very few respondents (7%) said they were afraid to bring old nets for re-treatment for fear of not getting a new one. For those people who brought nets for re-treatment 80% of them net re-treatment was done for them by someone else at the net distribution point as it was planned to be by the campaign.

### **Time spent by mothers travelling to attend the free LLIN campaign**

Time spent by mothers to travel to the distribution point for free net or net re-treatment services ranged between less than one to more than three hours. Only 47% of mothers travelled less than one hour and 4% travelled between 1 to 3 hours but the majority 49% travelled more than 3 hours to the distribution point and 56.7% reported to spend about 3 hours or more at the service delivery points waiting to get the service. Although we did not assess the number of distribution points that were used but it is likely that they were relatively few in number and not proportionally distributed according to where most people are living. We are aware that transport system in rural districts like Mpanda is very challenging so that mothers and their children have to walk most of the way to the distribution points.

### ***Conclusion***

Free net distribution campaign has contributed to 51.8% of nets owned by the households in the surveyed areas. Also it has contributed to 93% of treated nets found in the households in general. One month post free LLIN distribution and net re-treatment campaign ITN coverage in children underfive is 49% and the proportion of children underfive sleeping under ITN is 44% in Mpanda district. About 30% of free LLINs were still unused but kept for future

use probably because the preferred period for using nets in Mpanda is from December to May following long rains. Olyset nets distributed during the campaign constitute 77% of treated nets used by children under five. However, the registration of children under-five to receive free LLIN was lower than expected, only slightly less than half (44%) of children under-five were registered and received LLINs. On the other hand net re-treatment did not contribute much to the number of treated nets in the households despite a relatively high registration rate of 62.8% of households for net re-treatment. Many mothers approximately 50% of those who attended a free net campaign spent too much time three hours or more going to the distribution point and waiting to get services. Generally the campaign had some significant impact in raising ITN coverage in children under-five and in the general population as a whole in Mpanda district. However, our results suggest that with more careful planning targeting at improving registration of children and proper distribution of delivery points, a lot more can be achieved through a campaign like this.

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