MINISTRY OF HEALTH

Post Mass Long Lasting Insecticidal Net Distribution Survey, 2018

Evaluation of the 2017/2018 Long-Lasting Insecticidal Nets (LLINs) Mass Distribution Campaign

July 2019

Division of National Malaria Programme

Ministry of Health
P.O. Box 19982 KNH
Nairobi 00200, Kenya
http://www.nmcp.or.ke

Komesha Malaria Okoa Maisha

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The 2018 evaluation of 2017/18 Mass Long Lasting Insecticidal Net distribution was implemented by the National Malaria Control Programme (NMCP) of the Ministry of Health and the Kenya National Bureau of Statistics (KNBS) from November to December 2018. The Government of Kenya with support from the Global Fund, the Presidential Malaria Initiative (PMI) through Population Services Kenya (PS Kenya) and the World Health Organization (WHO) funded the evaluation.

Additional information about the 2018 PMLLIN may be obtained from the National Malaria Control Programme of the Ministry of Health, 19982, Kenyatta National Hospital, Nairobi 00202, Kenya; telephone: +254 20 271 6934/5; e-mail: head.domc@domckenya.or.ke; Internet: www.nmcp.or.ke.

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Table of Contents

CHAPTER 1: INTRODUCTION **12**

1.1: Country Profile 12

1.1.1: Geography, Climate and malaria transmission 12

1.1.2: Administration and Political structure 12

1.1.3 Health Financing 12

1.2 Demographic Indicators 12

1.3 Malaria Control in Kenya 13

1.3.1 Kenya Malaria Strategy 2019-2023 13

1.3.2: Epidemiology of Malaria in Kenya 13

Endemic: 14

Seasonal malaria transmission: 14

Malaria epidemic prone areas of western highlands: 14

Low-risk malaria areas: 14

1.3.3 Malaria interventions by endemicity Zone 14

Epidemiological zone 14

Interventions 14

1.4: Mass net distribution 2017/2018 15

1.4.1. Implementation 15

1.4.2. Stages of Mass Net Distribution 15

Table 4: Summary of stages of Mass Net Distribution 16

CHAPTER 2: 2018 PMLLIN SURVEY ORGANIZATION AND METHODOLOGY **17**

2: Survey Organization and Methodology 17

2.1 Objectives of the Survey 17

2.1.1. Main Objective 17

2.2 Survey Organization 17

2.3 Sample Design 17

2.4 Questionnaires 18

2.5 Training 18

2.6: Data collection and processing 18

2.7: Ethical Considerations 19

2.8 Response Rates 19

2.9 Challenges and Limitations 19

CHAPTER 3: HOUSING CHARACTERISTICS AND HOUSEHOLD POPULATION **20**

3.1 Household Characteristics 20

3.1.1 Household Drinking Water 20

3.1.2 Household Sanitation Facilities 22

3.1.3 Housing Characteristics 24

3.2 Household Possessions 25

3.3: Wealth Index 27

3.4: Household Population by Age, Sex, and Residence 27

3.5: Household Composition 29

Table of Contents

CHAPTER 4: LLIN COVERAGE AND USE **30**

4.1 Household Ownership of Mosquito Nets 30

4.1.1 Ownership of Mosquito Nets 30

4.1.2: Trends of LLINs ownership in PMLLIN 2017 and PMLLIN 2018 surveys 32

4.1.3 Source and Cost of Mosquito Nets 33

4.1.4 Access to Long-Lasting Insecticidal Nets 35

4.2: Use of Mosquito Nets 37

4.2.1. Use of existing LLINs 39

4.2.2: Use of mosquito nets by children 40

4.2.3: Use of mosquito nets by pregnant women 41

4.2.4 Mosquito Net Condition 42

4.3. Attitudes towards Mosquito Nets 45

CHAPTER 5: PROCESS EVALUATION OF THE 2017/2018 MASS LLIN CAMPAIGN **47**

5.1: Evaluation of Mass LLIN Campaign 47

5.1.1 Process outcome of LLIN distribution campaign 47

5.1.2 Household registration and collection of nets 47

5.1.3 Mean number of vouchers, LLINs received at the distribution points 48

Table 5.2: Mean number of vouchers received at the distribution points, PMLLIN 2018 49

5.1.4: Mean number of nets remaining in the household and reasons why other nets are no longer in the household. 50

5.2: IEC Communication during the mass net distribution campaign 51

5.2.1: IEC communication 51

5.2.2: Communication content 53

5.2.3: Demonstration on net hanging 53

5.2.4: Any other communications on mosquito net use or malaria prevention 53

5.3: Net care 57

5.3.1: Net washing 57

5.3.2: Frequency of net washing 57

5.3.3: What was used in addition to water when washing the mosquito nets 58

5.3.4: Where net was dried 58

5.4: Net hanging for sleeping 60

5.4.1: Net hanging for sleeping 60

5.4.2: Reasons for not hanging the net 60

5.5: Net preference 62

5.6: Comparison of 2014/15 and 2017/18 net and height preference 63

6. CONLUSIONS AND RECOMMENDATIONS **64**

6.1: Conclusion 64

6.2: Recommendations 64

Table of Contents

REFERENCES **65**
APPENDIX **65**
APPENDIX A: SAMPLE DESIGN **65**
Appendix 1 - Sample Design 65
A.1 Introduction 65
A.2 Sample Size and Allocation 65
A.3 Sample Frame 67
A.4 Sampling of PSUs and Households 67
A.5 Data Weighting 67
APPENDIX B: QUESTIONNAIRE (ENGLISH) **69**
APPENDIX C: CONSENT FORMS **70**
Consent Form (English) 70
Consent statement 71
Consent Form (Kiswahili) 72

APPENDIX D: MEMBERSHIP OF THE PMLLIN STEERING COMMITTEE **74**
PMLLIN Sub-committees 74
1. Technical subcommittee 74
2. Operations and Logistics subcommittee 74

APPENDIX E: SURVEY PERSONNEL **75**

List of figures

Figure 1: Map of Kenya showing malaria epidemiological zones
Figure 2: Population pyramid (n= 18,231)
Figure 3: Trends of Universal coverage LLINs ownership in 2017 and 2018, by epidemiological zone
Figure 4: Ownership of one LLIN for every two people in the Household by strata
Figure 5: Access to an LLIN by the household population
Figure 6: Use of LLINs in Households that have achieved universal coverage
Figure 7: Proportion of mosquito nets with no holes
Figure 8: Attitudes towards net use
Figure 9: Proportion of distributed nets no longer in use owned by the household (Other responses '18%')
Figure 10: If Net was ever washed and Proportion of HHs reported to have washed their Nets
Figure 11: Number of times the net had been washed in the last 6 months
Figure 12: Status of Net Hanging and Proportion of Nets that were hanging for sleeping by strata
Figure 13: Net Preference, colour and shape

List of tables

Table 1.2: Malaria interventions by Endemicity zones
Table 2: Mass Net distribution campaigns
Table 3: Summary of LLINs distributed 2017/2018 through mass campaign
Table 4: Summary of stages of Mass Net Distribution
Table A5: Sample Allocation for 2018 PMLLIN
Figure 4: LLINs ownership in 2017 and 2018
Figure 5: Ownership of one LLIN for every two people in the Household by strata
Figure 6: Shows LLIN procurement flow in Kenya
Figure 7: Summary of the tracking tools
Figure 8: Micro Planning Data Flow
Figure 9: Summary of Distribution Tools
Figure 10: Country Summary Budget

Acronyms and abbreviations

ACSM	Advocacy, Communication and Social Mobilization
CAPI	Computer Assisted Personal Interviewing
CS-Pro	Census and Survey Processing Software
DHS	Demographic and Health Survey
EA	Enumeration areas
GDP	Gross Domestic Product
IPC	Interpersonal Communication
IRS	Indoor Residual Spraying
KEPH	Kenya Essential Package for Health
KES	Kenya shilling
KMIS	Kenya Malaria Indicator Survey
KNBS	Kenya National Bureau of Statistics
LLIN	Long Lasting Insecticidal Net
LSM	Larval source management
MOH	Ministry of Health
NASSEP	National Sample Survey and Evaluation Programme
NMCP	National Malaria Control Programme
PMI	Presidential Malaria Initiative
PMLLIN	Post Mass Long Lasting Insecticidal Nets Evaluation Survey
PPS	Probability Proportional to Size
PS-Kenya	Population Services Kenya
SDG	Sustainable Development Goals
VIP	Ventilated Improved Pit
WHO	World Health Organization

FOREWORD

Malaria, a disease of public health concern, is responsible for days lost in education for learners as well as employee absenteeism. In addition to the deterioration in physical well-being of the patient, the disease affects family income. If not managed in time, the disease has a catastrophic impact and can result in brain damage (cerebral malaria) or even death.

The establishment of a Malaria Control Program in Kenya has yielded positive results over the years. Implementation of scientific evidence-based interventions by the program has reduced malaria prevalence from 38% in 2010 to 27% in 2015 (KMIS 2015). Regular and periodic review of the malaria programming helps in targeting of interventions for maximum impact.

Every three years, the national malaria control programme invests in mass distribution of LLINs in areas of high malaria transmission. This helps to protect the most at risk group (pregnant women and children under one year). Following every distribution campaign, a survey is conducted to understand; net availability, net retention and net use. Previous mass LLIN campaigns conducted in 2011/12, 2014/15 and 2017/18 have yielded great results. This report summarizes the findings of the most recent campaign (2017/18) focusing on net ownership, net retention and net use by the household members.

The survey findings show that LLIN coverage has increased following the mass distribution campaign but the universal coverage ownership (one net for every two persons resident in a household) is yet to be attained. I recommend this report to partners and malaria stakeholders in the country since it provides useful information on progress towards achieving universal coverage with LLINs. The report makes useful recommendations on social mobilisation efforts, targeted distribution, and advocacy at household levels that will impact the success of future distribution campaigns. I wish to appreciate all stakeholders who contributed technically and financially to the distribution of nets, conduct of the survey and writing of this report.

Dr. J. Wekesa Masasabi
Ag. Director General for Health

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Finally we would like to acknowledge responding community members who shared their experiences with the survey teams and provided useful information that will be used to guide the conduct of future surveys and malaria control interventions in general.

Dr. Pacifica Onyancha

Head, Department of Medical Services/ Preventive and Promotive Health

EXECUTIVE SUMMARY

Malaria continues to be a public health and socioeconomic concern in Kenya. The country has, however, made progress in malaria control through multipronged approaches, prevention and treatment interventions including distribution of long-lasting insecticidal nets (LLINs), intermittent preventive treatment in pregnancy, and diagnosis and management of malaria cases.

In malaria risk areas, vector control as an intervention is deployed to interrupt transmission and for burden reduction. According to the 'Kenya Malaria Strategy 2009 – 2018 (Revised 2014) which was in use by the time of this survey, the main vector control methods recommended in Kenya were: use of long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS) and larval source management (LSM) in targeted areas.

Distribution of LLINs to population at risk of malaria is achieved through the following channels: mass net distribution campaigns every three years; routine distribution at antenatal clinics for pregnant women and child welfare clinics for children less than 1 year. The most recent mass net distribution campaign was conducted between June 2017 and March 2018. The LLINs are designed to maintain their biological efficacy against vector mosquitoes for at least three years when used as recommended.

After every mass LLIN distribution campaign, the NMCP conducts a post-mass LLIN survey to measure key outcomes including net ownership and use. This was the fourth PMLLIN survey to be conducted following the 4th mass net campaign and it was done in November - December 2018 in 23 counties. The survey measured key outcomes including availability and retention of nets; use of nets by household members, net preferences and the effectiveness of the IEC campaign preceding the distribution.

The sample for the survey was drawn from the fifth National Sample Survey and Evaluation Programme (NASSEP V) sampling frame, a household-based sampling frame developed and maintained by KNBS. The PMLLIN survey administered the same household questionnaire used in the KMIS 2015 and PMLLIN Survey 2017 to allow comparability of data. The survey was conducted in 168 clusters (99 rural and 69 urban) with a representative sample of 5,040 households in the 23 counties visited.

Household ownership of mosquito nets:

Eighty three percent of households surveyed own at least one long-lasting insecticidal net (LLIN). There is variation by endemicity with Lake Endemic reporting this at 85 percent, Highland endemic at 83 percent and Coast endemic at 77 percent. The average number of LLINs per household at the time of the survey was 2.4 with the highest number in the Lake endemic at reported 2.6 and Coast endemic reporting the lowest number at 2.3. The average number of LLIN per household increased to 2.4 from the 1.8 reported in PMLLIN 2017. The highest increase was reported in Coast endemic, from 1.3 to 2.3.

Universal Coverage:

Fifty-one percent of households surveyed attained universal coverage (had at least one LLIN for every two people). This was an increase from 47 percent in the PMLLIN 2017. Highland epidemic and coastal endemic had the highest coverage at 55 percent and 54 percent respectively. The lake endemic areas had 45 per cent.

Source, cost and access to an LLIN

Seventy-four percent of nets were acquired from the 2017/18 mass net campaign compared to 52 percent during 2014-2015 campaign. Eight percent of nets were received through routine continuous distribution in government or faith-based clinics or hospitals.

Majority of the nets found in the surveyed households (94 percent) were accessed for free, while three percent were purchased for 500 Kenyan Shillings or less. Ninety-seven percent of nets in rural areas were accessed for free compared with 83 percent in urban areas. In the coast endemic zone, 89 percent of the nets were free, while in the highland epidemic, 95 percent of the nets. The lake endemic zones had the highest number of free nets 95 percent among the households surveyed. More nets were purchased by households in the highest wealth quintile (23 percent) compared to 0.7 percent in the lower wealth quintile households. Among nets that were not free, the average cost was KES. 700.

Nine percent of the population in the areas targeted by the mass net distribution slept in homes without any LLINs the night before the survey. On average, half of the population slept in houses with two and three LLINs. The proportion of people with access to an LLIN was 75 percent across all epidemiological zones surveyed.

Use of mosquito nets at the household

The use of LLIN in households that have attained universal coverage (1 LLIN for every 2 people) increased from 88 percent in the 2017 PMLLIN survey to 91 percent in the current survey. There was a slight drop in LLIN use in household with at least one LLIN, from 88 percent in 2017 to 87 percent in 2018.

Use of existing LLINs

The highest use of existing LLINs was in middle wealth quintile and lowest in low wealth quintile at 81 and 73 percent respectively while the highest by malaria endemicity was in highland epidemic at 79 percent.

Use of mosquito nets by children below 5 years

In households with children under five years, 73 percent of these children slept under an LLIN the night before this survey, compared to 78 percent in 2017 survey, reflecting a five percent decrease. In households with children under five years and reflecting the universal coverage of nets, 97 percent of these children slept under an LLIN, the highest number (97 percent) being reported in the Coast endemic zone at 97 percent.

About 74 percent of all pregnant women in the survey slept under an LLIN the night before the survey in all households. The highest rate was reported in the lake endemic area, at 76 percent. For households that have attained universal coverage and which had a pregnant woman, 97 percent of these women slept under an LLIN, with 99 percent being reported in the Lake endemic region.

Receipt of messages, perceptions and attitudes towards mosquito nets

Multiple channels were used to convey messages about mass net distribution. These included chief barazas, Community Health Volunteers, posters, health care workers, among others. Majority (49 percent) of the messages received were those passed through community leaders followed by radio with 38 percent.

Majority of the respondents (65 percent) preferred blue while white and green scored 14 percent each. Slightly above half of the respondents (53 percent) preferred rectangular shape, (43 percent) preferred conical shape while (4 percent) had no preference.

Conclusions

Eighty-three percent of households surveyed owned at least one LLIN. In addition, 51 percent had attained universal coverage of LLINs. Ownership of LLINs increased with the average number of LLINs per household being reported at 2.4, up from 1.8 the previous PMLLIN survey. Three quarters of the household population surveyed had access to an LLIN in which, 66 percent of household members slept under an LLIN the night before the survey. In addition, 91 percent of members of households with at least one LLIN for every two people slept under an LLIN the night before the survey. About three quarters (73 percent) of children under five years slept under an LLIN the night before the survey. In households with at least an LLIN, the use by children under five years was 88 percent. Seventy-five percent of pregnant women slept under an LLIN the night before the survey, and 97 percent of pregnant women slept under an LLIN in households with one or more LLIN for every two people.

The best source of information on mass net campaign was through existing community structures (community leaders, interpersonal communication during registration, barazas, health workers) and radio. For every 10 respondents interviewed, six either strongly agreed or somewhat agreed that people were at risk of getting malaria throughout the year.

Recommendations

The survey recommends that alternative channels for provision of LLINs (e.g. use of existing community health structure data or registration data) be explored in order to increase ownership so 100% of households have at least one LLIN for every two people, and sustain this. There is also need to sustain accurate, targeted communication to ensure the continued use of LLIN by all household members and especially the most vulnerable through various channels. Procurement of nets for all epidemiological zones should be blue and either conical or rectangular.

CHAPTER 1: INTRODUCTION

1.1: Country Profile

1.1.1: Geography, Climate and malaria transmission

Kenya is situated in the eastern part of Africa. It borders Ethiopia to the north, Somalia to the northeast, Tanzania to the south, Uganda to the west, South Sudan to the Northwest, and the Indian Ocean to the southeast. Eighty percent of land area is arid or semi-arid, and only 20 percent is arable. The country has two main regions: lowlands and highlands. The lowlands include the coastal and the lake region, and the highlands fall on both sides of the Rift Valley. Rainfall and temperatures are influenced by altitude and proximity to the Indian Ocean. The coastal region has a tropical climate, with both rainfall and temperatures higher than the rest of the country throughout the year. These factors have influenced the epidemiology of malaria in the country. Malaria transmission and infection risk across the geographic regions in Kenya is determined largely by altitude, rainfall patterns, and temperature. The lake and coastal regions have the highest burden of malaria in the country.

1.1.2: Administration and Political structure

The country has two levels of governance, the national and regional/county governments. The 47 county governments comprise 302 sub-counties. The country covers about 582,000 square kilometres. The national and county governments are interdependent with a mix of specific and shared functions at each level. Healthcare is a devolved function for county governments with the national level functions including policy formulation, managing the national referral hospitals, maintaining norms and standards, capacity building and technical assistance to the counties and monitoring and evaluation. County governments are responsible for service delivery at facility and community levels.

1.1.3 Health Financing

Over the past five years, the allocation to health in the county budget has increased steadily, from an average of 21.5 percent in 2014/15 to 27 percent in 2017/18. In aggregate, the total allocation to the health sector both at the national and county levels for the past five years increased, from 7.5 percent in 2014/15 to 8.2 percent in 2017/18.

1.2 Demographic Indicators

Kenya's population was projected to be 50.8 million in 2018, with a population density of 85.3 per square kilometre (Table 1.1). A summary of the projected trends of key indicators from 2009 to 2018 shows a reducing total fertility rate, a slight improvement in life expectancy, and a slight reduction in crude death rate and infant mortality rate (MoH 2019).

Indicators	2009 (Census)	2010	2011	2012	2013	2014	2015	2016	2017	2018
Population (millions)[a]	39.1	40.3	41.4	42.7	44.0	45.3	46.6	48.0	49.5	50.8
Density (pop./km2)[a]	65.7	67.6	69.6	71.7	73.8	76.0	78.3	80.7	83.1	85.3
Total fertility rate[b]	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.9		
Crude birth rate[c]	35.8	35.1	34.3	33.6	32.9	32.3	31.8	31.3		
Crude death rate[d]	7.8	7.3	6.8	6.5	6.2	6.0	5.8	5.7		
Infant mortality rate (per 1,000 live births)[e]	43.6	42.5	41.3	40.6	39.6	38.2	36.5	35.6		
Life expectancy at birth (total)[f]	61.7	62.9	64.0	64.9	65.7	66.2	66.7	67.0		

Table 1.1: Basic Demographic Indicators

KNBS projected figures

- World Development Indicators (https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=KE)
- World Development Indicators (https://data.worldbank.org/indicator/SP.DYN.CBRT.IN?locations=KE)
- World Development Indicators (https://data.worldbank.org/indicator/SP.DYN.CDRT.IN?locations=KE)
- World Development Indicators (https://data.worldbank.org/indicator/SP.DYN.IMRT.IN?locations=KE)
- World Development Indicators (https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=KE)

1.3 Malaria Control in Kenya

1.3.1 Kenya Malaria Strategy 2019-2023

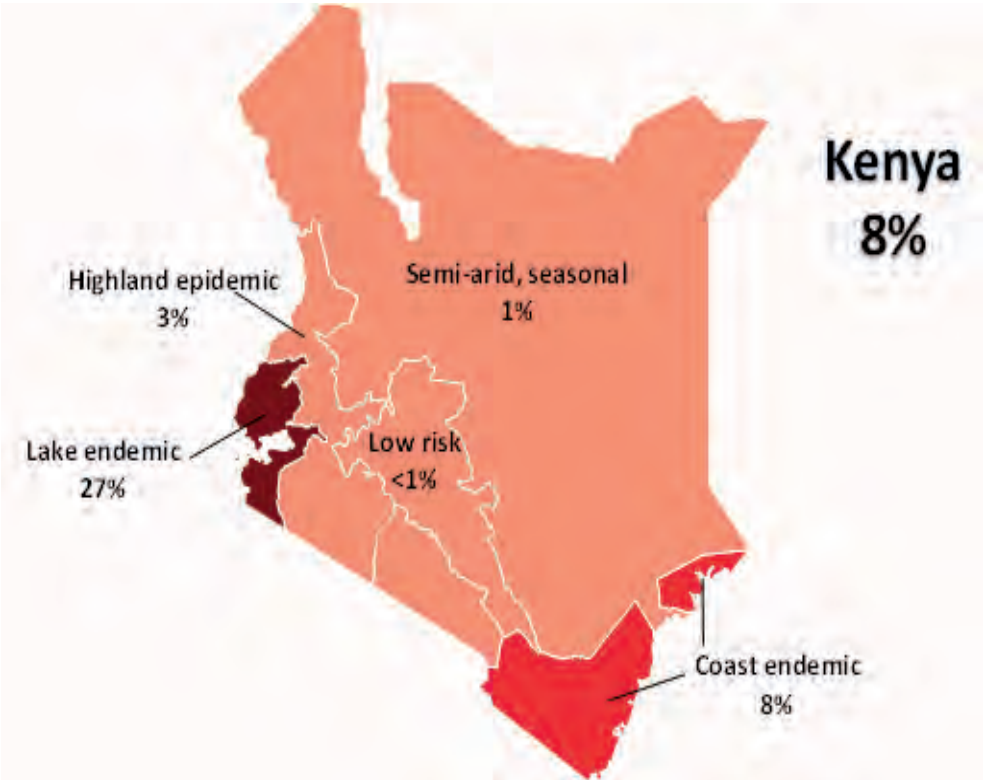
The vision for malaria control is to have a malaria free Kenya. The mission is to direct and coordinate efforts towards a malaria free Kenya through effective partnerships. The goal of the Kenya Malaria Strategy is to reduce malaria incidence and deaths by at least 75 percent of the 2016 levels by 2023.

To achieve this goal the following six strategic objectives were identified:

1. To protect 100 percent of people living in malaria risk areas through access to appropriate malaria preventive interventions by 2023.
2. To manage 100 percent of suspected malaria cases according to the Kenya malaria treatment guidelines by 2023.
3. To establish systems for malaria elimination in targeted counties by 2023.
4. To increase utilization of appropriate malaria interventions in Kenya to at least 80 percent by 2023.
5. To strengthen malaria surveillance and use of information to improve decision making for programme performance.
6. To provide leadership and management for optimal implementation of malaria interventions at all levels, for the achievement of all objectives by 2023.

1.3.2: Epidemiology of Malaria in Kenya

Kenya has four main malaria epidemiological zones with diversity in risk determined largely by altitude, rainfall patterns, and temperature (Figure 1).



(Source: KMIS 2015)

Figure 1: Map of Kenya showing malaria epidemiological zones

The different zones are as follows:

Endemic:

This includes areas of stable malaria with altitudes ranging from 0 to 1,300 meters around Lake Victoria in western Kenya and in the coastal region. Rainfall, temperature, and humidity are the determinants of the perennial transmission of malaria in this zone. The vector life cycle is usually short with a high survival rate due to the suitable climatic conditions. Transmission is intense throughout the year, with annual entomological inoculation rates between 30 and 100 (Degefa, et al., 2017). Malaria parasite prevalence in 2015 was 27 percent in the lake endemic zone and 8 percent in the coast endemic zone (NMCP, 2015).

Seasonal malaria transmission:

Seasonal malaria transmission occurs in the arid and semi-arid areas in northern and south-eastern parts of Kenya that experience short periods of intense malaria transmission during the rainy season. Temperatures are usually high, and water pools created during the rainy season provide breeding sites for malaria vectors. Extreme climatic conditions like El Niño that lead to flooding can cause malaria epidemics with high morbidity due to the low immune status of the population. Malaria parasite prevalence in this zone was less than 1 percent in 2015 (NMCP, 2015).

Malaria epidemic prone areas of western highlands:

Malaria transmission in the western highlands of Kenya is seasonal, with considerable year-to-year variation. Epidemics occur when climatic conditions favour sustained minimum temperatures of around 18°C that sustain vector breeding, resulting in increased intensity of malaria transmission. The whole population is vulnerable, and fatality rates during an epidemic can be up to 10 times greater than what is experienced in regions where malaria occurs regularly. Malaria prevalence in this zone was 3 percent in the KMIS 2015. (NMCP, 2015)

Low-risk malaria areas:

This zone covers the central highlands of Kenya, including Nairobi. The temperatures are usually too low to allow completion of the sporogonic cycle of the malaria parasite in the vector. However, increasing temperatures and changes in the hydrological cycle associated with climate change are likely to increase the areas suitable for malaria vector breeding, leading to the introduction of malaria transmission in areas it never existed before. Malaria parasite prevalence in low-risk areas was less than 1 percent in the 2015 KMIS.

1.3.3 Malaria interventions by endemicity Zone

The various interventions are implemented based on the epidemiological setting. Table 1.2 is a summary of recommended malaria prevention and control interventions by endemicity zone.

Epidemiological zone	Interventions							
	Case Management	Routine LLIN	Mass LLIN distribution	IRS	Health Education & SBCC	IPTp	E P R	Surveillance
Lake stable Endemic & Coast Endemic	X	X	X	X	X	X		X
Highland Epidemic prone	X	X	X	X	X		X	X
Seasonal transmission including arid and semi-arid	X	X			X		X	X
Low risk	X				X			X

Source: (Kenya Malaria Policy 2010)

Table 1.2: Malaria interventions by Endemicity zones

Vector control is one of the key preventive interventions in malaria control and will continue to be a major focus in the Kenya Malaria Strategy 2019-2023 (MoH 2019). The core vector control strategies are the distribution of long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS) in targeted areas, and larval source management (LSM).

1.4: Mass net distribution 2017/2018

1.4.1. Implementation

The malaria control programme has conducted several mass LLIN campaigns since 2006, the most recent mass net distribution campaign being conducted from June 2017 to March 2018 (See Table 1.3)

Period	Target Population	Number of nets distributed	Type of Campaign
2006	Children 9 months to 5 years all over the country	3.4 million	phases; 1. combined with measles vaccine 2. standalone
2011-2012	All at risk of malaria in 80 districts in Lake and Coast Endemic and Epidemic-prone zones	10.6 million	Phased campaign
2014-2015	All at risk of malaria in 23 counties in malaria endemic and epidemic-prone zones.	13.1 million	Phased campaign
2017-2018	All at risk of malaria in 23 counties in malaria endemic and epidemic-prone zones.	15.1 million	Phased campaign

Table 1.3: Mass Net distribution campaigns

The 2017/2018 mass LLIN distribution campaign was conducted as a phased campaign, targeting 25 million people residing in 23 counties in malaria endemic and epidemic prone counties. The campaign aimed at achieving universal coverage and successfully distributed 15.1 million LLINs. The total LLINs need is determined by dividing the total population for the target year of distribution by 1.8 and making adjustments based on the previous experience and duration since the last population census. A number of development partners (donors) contribute to the ITNs given out of each distribution campaign. Table 1.4 below the number of LLIN contributed by each donor and per county.

Counties	Phases	Number of nets	Funder	Dates
Kisumu, Migori, Homabay, and Vihiga	I	2,567,957	Global Fund	June 2017
Kericho, Bomet, Uasin Gishu, Trans Nzoia, Nandi, West Pokot, Narok, Siaya	II	4,641,149	Global Fund	July 2017
Kakamega, Busia, Bungoma, Kisii, Nyamira	III	4,810,533	Global Fund	Nov–Dec 2017
Lamu. Kilifi, Kwale	IV	1,426,750	Global Fund	Dec 2017
Mombasa, Taita-Taveta, and Tana River	V	1,152,994	Global Fund	Feb–Mar 2018
Total available		15,035,094		

Table 1.4: Summary of LLINs distributed 2017/2018 through mass campaign

1.4.2. Stages of Mass Net Distribution

Planning for the mass LLIN distribution campaign of 2017/2018 was done at two levels, national level (macro-planning) and county/ sub-county level (micro-planning), under the leadership of the National Malaria Control Program (NMCP) and in collaboration with key malaria stakeholders. The LLIN distribution was divided into three stages as summarized in the Table 1.5.

Distribution Stages	Key activities
Preparatory activities	Sensitization of stakeholders on mass net process
	Training of Registration and distribution teams
	Receipt and disbursement of tools and other materials
Registration Process	Social mobilization for registration
	Household registration
	Supervision of registration
	Collation of registration data, analysis and report writing
Delivery of LLINs	Receipt of LLINs at designated points (Drop-off points)
Distribution	Sensitization of stakeholders on distribution
	Social mobilization for collection of LLINs
	Setup of net distribution posts and logistics
	Distribution of LLINs at fixed posts to house holds
	Supervision of distribution teams
	Collation of distribution data, analysis and report writing
	Stakeholders meeting to review the results of the campaign at County and sub county level

Table 1.5: Summary of stages of Mass Net Distribution

CHAPTER 2: 2018 PMLLIN SURVEY ORGANIZATION AND METHODOLOGY

2: Survey Organization and Methodology

The 2018 post mass Long Lasting Insecticidal Treated Net survey is the fourth survey of its kind in Kenya. The first PMLLIN survey was conducted following the mass campaign of 2006 while the second and the third were done in 2011/2012 and 2016/2017 respectively. As with the previous PMLLIN surveys, the design of 2018 survey followed the Roll Back Malaria Monitoring and Evaluation Working Group guidelines, the Kenya National Malaria Strategy 2009-2018 (revised 2014), and the Kenya Malaria Monitoring and Evaluation Plan 2009-2017. The 2018 PMLLIN was carried in November – December 2018 in the 23 counties where LLIN distribution was done and covered representative sample of 5,040 households.

2.1 Objectives of the Survey

2.1.1. Main Objective

The main objective of the survey was to evaluate the 2017/2018 mass net distribution. The survey was designed to look at the net availability within households, net retention within households, net use by the different household members and communication concerning the campaign before and during the mass net distribution exercise. A focus was given to endemicity, age and for women aged 15 – 49 their pregnancy status, residence type and social economic status.

2.1.2: Specific objectives

Specific objectives for the survey were to:

1. Measure household ownership and use of any net or Campaign LLIN.
2. Measure household retention of campaign LLINs.
3. Determine household access to LLINs
4. Measure the Mass campaign processes
5. Measure respondent exposure to LLIN messages
6. Determine net preference in terms of colour, height and shape

2.2 Survey Organization

The 2018 PMLLIN survey was implemented by the Ministry of Health (MOH) through National Malaria Control Programme (NMCP) in collaboration with the Kenya National Bureau of Statistics (KNBS). Financial and technical assistance from Presidential Malaria Initiative (PMI) through PS Kenya, from World Health Organization (WHO), from county governments and from other institutions and partners. The survey was overseen by the PMLLIN Steering Committee and coordinated by Malaria Monitoring and Evaluation committee of Experts. Field activities were coordinated by NMCP in collaboration with KNBS. The two institutions were also responsible for sample design, training of field staff, data collection, analysis, and report writing.

2.3 Sample Design

The 2018 PMLLIN survey was a population-based survey designed to produce representative estimates for key indicators at each of the 3 Malaria epidemiologic zones: highland epidemic, lake endemic and coast endemic. The sample size was calculated for each of the zones resulting in a total sample of 5,040 households. The survey covered population residing in conventional households.

The survey sample was drawn from the Fifth National Sample Survey and Evaluation Programme (NASSEP V) sampling frame, a household-based sampling frame developed and maintained by KNBS. The primary sampling unit for NASSEP V master sampling frame is a cluster, which constitutes one or more Enumeration Areas, with an average of 100 households per cluster. The frame consists of 5,360 clusters split into four equal sub-samples. These clusters were drawn from approximately 96,000 enumeration areas (EAs) in the 2009 census database using probability proportional to size (PPS) method. The frame is stratified into urban and rural areas within each of 47 counties resulting into 92 sampling strata with Nairobi and Mombasa counties being wholly urban.

The survey used a two-stage stratified cluster sampling design. In the first stage, 168 clusters (99 in rural 69 in urban) were selected with equal probability from NASSEP V sampling frame. The second stage involved random selection of a uniform sample of 30 households in each cluster from a roster of households in the cluster using systematic random sampling method. In the end, a total of 5,040 households were selected for the survey. Due to the non-proportional allocation of the sample, the survey was not self-weighting. The resulting data has, therefore been weighted to be representative at each of the epidemiological zones. Further details on the sample design are provided in Appendix A. It is worth noting that some clusters had not been updated before the survey and therefore households that had come up after the last cluster update were excluded from the sample.

2.4 Questionnaires

This survey utilized the questionnaire used in two previous surveys (KMIS 2015 and PMLLIN 2015). This was done in order to ensure comparison with these surveys. Information on all the usual members and visitors in the selected households was collected. Specifically, information was collected on the following: household residents and their characteristics; housing characteristics; household possessions; and ownership and use of mosquito nets. In addition, the survey captured additional information on perceptions of the campaign process, the mass net distribution process itself and messaging about the campaign (see questionnaire in Appendix B)

2.5 Training

Training of the 10 survey field teams took place between 12th to 15th November 2018 involving 40 research assistants, 10 team supervisors and four additional persons to be deployed on a need to basis. Each team comprised of one supervisor and four research assistants. The training comprised survey background, interviewing techniques, consenting, questionnaire and Computer Assisted Personal Interviewing (CAPI) techniques. A day was set aside for teams to practice how to collect and transfer or submit this data. This was done in some clusters but the data collected during this exercise was not included in the survey sample (Appendix A).

2.6: Data collection and processing

Each interview is a new source of information and therefore should be made interesting and pleasant by building rapport with the respondent through; making a good first impression, obtaining respondent's informed consent and assuring confidentiality of responses among others.

After the survey training, each team (a supervisor and four research assistants) was allocated clusters according to local language competency. Thereafter, they were given a number of supporting information, including a list of the selected clusters and households with their numbers, contacts of the County Statistical Officers (CSOs) in each county, the phones which they used for interviewing, their funds for their daily subsistence allowances, fuel and lunch allowances for CSOs, enumerators, chiefs, Assistant chiefs and village elders and were also allocated vehicles and drivers they would be working with. Official communication about the survey had been done to the survey counties.

Fieldwork took 30 days. It started from 18th November and was completed on 18th December, 2018. The teams spent on average, one and half days in each cluster. On the first day in a cluster in each county, the teams paid a courtesy call to the County Statistical Officer (CSO). The CSO, an officer in-charge of KNBS at the county, led the team in paying a courtesy call to the county administration and the department of health. The CSO also facilitated the survey by providing cluster maps and introducing the team to the enumerator who in turn introduced the team to the local area chief and assistant chief of the selected cluster. At the cluster the team worked with the village elder who indicated to them cluster boundaries. Further, the village elder introduced the RAs to the respondents and took care of their safety while in the cluster. The team supervisor would allocate the households among the research assistants and then interviews started by identifying the households by use of the household numbers provided. Where eligible respondents were not at home, a minimum of two additional callback visits were made. Fieldwork was supervised by a team of national coordinators derived from the NMCP, KNBS and PS Kenya to ensure that the survey was conducted according to the protocol and to provide real-time solutions to any challenges encountered.

The 2018 PMLLIN questionnaire was programmed using Census and Survey Processing Software (CSPro), Computer Assisted Personal Interviewing (CAPI) application called Census and Survey (CS) Entry. The program was then uploaded into Android based smart phones which were used to collect data. The application ran offline but the smart phones had SIM cards loaded with units to enable data transfer (data bundles) which Research Assistants would transmit data at intervals to a central server. This software was chosen due to its simplified user interface and availability of in-house technical support.

Each supervisor and RA was assigned a unique identification number to allow easier monitoring of their individual fieldwork performance. The program had in-built data skips and check procedures to minimize data entry errors. To further improve on data quality, sampled clusters and households were preloaded into the tool. At the central office, the uploaded data was continuously merged and checked for inconsistencies by survey subject-matter specialists assisted by the Data Processing team. Any anomalies were communicated to respective teams through team Supervisors. Corrected data was re-transmitted to the central server for further processing. At the end of the survey, each cluster and household was verified using the sampled list. The last step before generation of the summary result tables was data editing and cleaning which included structural and internal consistency checks. Summary tables were generated using an analysis plan developed to guide on the expected data outputs (CSPro and SPSS).

Household wealth index was calculated using data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. It is a composite measure of a household's cumulative living standard. This index categorizes households into five wealth quintiles that will enable one to see the difference in health indicators by economic status. This is constructed by using Principal Component Analysis (PCA) where household assets are run as frequencies and the categorical variables are generated as dichotomous variables, factor analysis run and wealth quintiles calculated with cutoff points to give the five wealth quintiles. This is usually weighted equal to the sample weight.

2.7: Ethical Considerations

The protocol of the PMLLIN survey 2018 was approved by the Kenyatta National Hospital/University of Nairobi Scientific and Ethics Review Committee (ethical review number P/696/09/2018). Confidentiality and anonymity were ensured to the greatest extent possible throughout the data collection and processing procedures. During data collection in the field, verbal and written informed consent was sought before administration of the questionnaires. The risks and benefits of participation in the survey were explained to each participant during the process of informed consent. After reading or being read to the consent form and agreeing to participate, the research assistant and the respondent signed two copies of the consent form; one form was left with the respondent while the enumerator retained the second copy. For participants who could not sign the consent form, a thumb print was used to indicate consent to the survey.

The identification numbers and respondents' names and contact information (from the household listing) were stored separately during fieldwork and were removed from the electronic database during analysis. Participation in the survey did not pose any known risk to the respondents. Respondents were not compensated or given any incentives to participate in the survey and there were no direct benefits to the respondents for consenting to participate in the interview. However, results would be used to assess the coverage of LLIN related indicators and also inform the planning of subsequent LLIN distribution and surveys.

2.8 Response Rates

The response rates for the survey were high as shown in Table 2.1. In total, 5,040 households had been selected for the survey out of which 4,336 were occupied at the time of the survey. Out of these occupied households, 4,247 households responded to the questionnaire representing an overall response rate of 98 per cent. Response rate for rural households was marginally higher (98 per cent) compared with that of the urban households at 97 per cent.

Number of households, number of interviews, and response rates, according to residence (unweighted), Kenya 2018			
	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	2,070	2,970	5,040
Households occupied	1,710	2,626	4,336
Households interviewed	1,666	2,581	4,247
Household response rate[1]	97.4	98.3	97.9
[1] Households interviewed/households occupied			

Table 2.1: Results of the household and individual interviews

2.9 Challenges and Limitations

Any survey is bound to have challenges. The following challenges were reported by the field teams;

- Some clusters were not updated and therefore some houses were either destroyed, changed to offices, shops, stores e.t.c.
- Some cluster maps were not available or were not in good condition.
- Some house doors had been painted hence teams were not able to locate the KNBS enumerated household numbers
- Some areas had weak or no mobile network signals hindering the transfer of data to the central server
- Some teams experienced mechanical breakdown of their vehicles
- In the first week, funds for teams' allowances were delayed causing challenges in fueling the vehicles, facilitating the team members, County Statistical Officers, chiefs, Assistant Chiefs and village elders
- The allocated lunch allowances for village elders was not adequate. This is because the allocation was only for one person per cluster yet some teams had more than one village elders accompanying them.
- Some households in urban clusters had members travel upcountry for December holidays December hence many call backs or failure to interview them.

CHAPTER 3: HOUSING CHARACTERISTICS AND HOUSEHOLD POPULATION

Key Findings

- The majority (62 percent) of households in the areas surveyed do not have electricity.
- The most commonly used materials for the floor, wall and roof materials are cement, dung/mud/sod and iron sheets respectively.
- Four in 10 households use one room for sleeping.
- Eighty-eight percent of the households own a mobile phone while 71 percent own a radio.
- Only a quarter of household are headed by females.
- The mean size of household is 4.7 members.

This chapter gives an overview of the demographic and socioeconomic characteristics of the households sampled in the 2018 PMLLIN Survey. In the PMLLIN Survey, a household is defined as a person or group of persons, related or unrelated, who usually live together, acknowledge one adult member as the head of the household, and who have common cooking arrangements. Information was collected on all usual residents of a selected household as well as persons who had stayed in the selected household the night before the interview.

The chapter also presents information on the conditions of the households in which the survey population lives, including the source of drinking water, sanitation facilities, household characteristics, possessions and wealth.

3.1 Household Characteristics

The characteristics of a household determine the socioeconomic and health status of its members. The 2018 PMLLIN Survey asked respondents about their household environment, including the source of drinking water, type of sanitation facility, building characteristics such as type of material used for the roofing, flooring, and walls; number of rooms used for sleeping and the number of nets the households had for the prevention of malaria.

3.1.1 Household Drinking Water

Lack of easy access to an improved water source may limit the quantity of suitable drinking water that is available to a household as well as increase the risk of illness. Households are considered to use improved drinking water if the water is obtained from the following sources: piped water into the dwelling, yard, or plot; a public tap/standpipe or borehole; a protected well or protected spring water, rainwater and bottled water. Unimproved water sources increase the spread of waterborne disease and the burden of service delivery through increased demand for health care; these sources include unprotected wells or springs, water delivered by tanker trucks, and surface water as shown in table 3.1.

Percent distribution of households and population by source of drinking water, time to obtain drinking water, and meantime to obtain drinking water, according to residence, Kenya 2018

	Households			Population		
Background characteristic	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Source of drinking water						
Improved source	**85.8**	**55.5**	**65.4**	**84.5**	**54.2**	**62.1**
Piped water into dwelling/yard/plot	35.1	7.0	16.2	31.4	5.9	12.5
Piped to neighbour	13.5	9.6	10.9	12.8	9.6	10.4
Public tap/standpipe	10.1	4.1	6.0	10.6	4.0	5.7
Tube well/borehole	5.9	8.4	7.6	6.2	8.6	8.0
Protected dug well	9.2	10.6	10.1	10.9	10.2	10.4
Protected spring	5.2	11.9	9.7	6.7	12.2	10.8
Rainwater	3.1	3.9	3.7	3.2	3.7	3.6
Bottled water	3.8	0.1	1.3	2.8	0.0	0.7
Non-improved source	**13.7**	**42.9**	**33.3**	**15.5**	**44.8**	**37.1**
Unprotected dug well	1.4	4.3	3.3	1.6	4.7	3.9
Unprotected spring	1.1	5.5	4.0	1.4	5.6	4.5
Tanker truck/cart with drum	3.4	0.7	1.6	3.1	0.5	1.1
Surface water	7.9	32.5	24.4	9.4	34.0	27.6
Other source	0.0	1.2	0.8	0.0	1.1	0.8
Missing	**0.4**	**0.4**	**0.4**	**0.0**	**0.0**	**0.0**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises	66.6	25.0	38.7	63.0	22.4	33.0
Less than 30 minutes	21.7	40.5	34.3	24.4	41.3	36.9
30 minutes or longer	8.4	34.0	25.6	10.2	35.7	29.1
Don't know	3.3	0.5	1.4	2.4	0.5	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean time to obtain drinking water (minutes)	5.9	22.8	17.3	7.1	23.7	19.4
Number	1,392	2,855	4,247	5,148	14,621	19,769

Table 3.1: Household drinking water

Table 3.1 shows that about 65 percent of households in the survey obtain drinking water from an improved source, while 33 percent use non-improved sources. The use of improved sources is more common among households in urban areas (86 percent) than among those in rural areas (56 percent). In urban areas, the most common source of drinking water is water piped into the dwelling/yard/plot, with over a third (35 percent) of households using this source. In the rural areas, the most common source of drinking water is surface water (33 percent).

Thirty-nine percent of households have the source for their drinking water on their premises, while 26 percent spend 30 minutes or longer to obtain their drinking water. The mean time taken by household members to fetch drinking water was 17 minutes which is an improvement from the 22 minutes reported in PMLLIN 2015.

3.1.2 Household Sanitation Facilities

Unicef classifies sanitation facilities into improved and non-improved facilities. Improved sanitation facilities are those that can hygienically separate human excreta from human contact. They include toilets/latrines that flush or pour-flush into a sewer system, septic tank, or pit latrine; ventilated improved pit (VIP) latrines; pit latrines with a slab; or composting toilets.

Non-improved sanitation facilities include flush or pour-flush to elsewhere, pit latrines without slab or open pit, bucket, hanging toilet or hanging latrine, bush and no facilities.

Shared facilities of any type are also considered to be non-improved.

Table 3.2 shows the distribution of households and de jure population by type of toilet or latrine facilities, according to residence. Thirty-seven percent of the households used improved sanitation facilities with no marked difference between urban and rural areas. In the 23 counties surveyed, forty percent of households used non-improved sanitation facilities of which pit latrine without slab or open pit is the most common (35 percent).

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Kenya 2018						
	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility						
Flush/pour flush to piped sewer system	8.3	0.2	2.9	7.4	0.2	2.1
Flush/pour flush to septic tank	8.7	0.5	3.2	9.3	0.4	2.7
Flush/pour flush to pit latrine	2.8	0.8	1.4	3.6	0.7	1.5
Ventilated improved pit (VIP) latrine	4.7	6.2	5.7	6.4	6.3	6.3
Pit latrine with slab	14.0	28.1	23.5	17.1	29.4	26.2
Composting toilet	0.4	0.1	0.2	0.5	0.1	0.2
Total	38.9	36.0	36.9	44.2	37.2	39.0
Shared facility[1]						
Flush/pour flush to piped sewer system	2.8	0.2	1.0	2.0	0.1	0.6
Flush/pour flush to septic tank	6.1	0.2	2.1	4.3	0.1	1.2
Flush/pour flush to pit latrine	4.1	0.7	1.8	3.3	0.6	1.3
Ventilated improved pit (VIP) latrine	5.8	2.0	3.2	5.2	1.6	2.6
Pit latrine with slab	23.5	9.8	14.3	21.4	7.5	11.1
Composting toilet	0.3	0.1	0.2	0.1	0.1	0.1
Total	42.6	13.0	22.7	36.3	9.9	16.8
Non-improved facility						
Flush/pour flush not to sewer/ septic tank/pit latrine	1.9	0.2	0.7	1.8	0.2	0.6
Pit latrine without slab/open pit	15.7	45.0	35.4	17.0	47.2	39.3
Bucket	0.1	0.1	0.1	0.1	0.1	0.1
Hanging toilet/hanging latrine	0.0	0.0	0.0	0.0	0.0	0.0
No facility/bush/field	0.4	5.2	3.6	0.5	5.3	4.1
Other	0.0	0.1	0.1	0.0	0.1	0.1
Total	18.1	50.7	40.0	19.5	52.9	44.2
Total	99.6	99.6	99.6	100.0	100.0	100.0
Number	1,392	2,855	4,247	5,148	14,621	19,769
[1] Facilities that would be considered improved if they were not shared by two or more households.						

Table 3.2: Household sanitation facilities

3.1.3 Housing Characteristics

Table 3.3 shows the information of housing characteristics by place of residence. These characteristics are usually a function of the household's socio-economic situation and have a direct bearing on the health and welfare of household members. The table includes information on access to electricity, type of flooring, roofing and walling material and number of rooms used for sleeping. In the 23 counties surveyed, 37 percent of households have electricity; the majority of households in urban areas have electricity (76 percent), while the vast majority of rural households do not (only 18 percent have electricity).

Cement is the most common household flooring material with 39 percent of households having cement floors. The cement floors are much more common in urban households (62 percent) than in rural households (28 percent). The most common flooring in rural households is earth/sand (29 percent). Iron sheets are the main roofing material (89 percent). No marked difference was found between urban and rural areas in the roofing material used.

The Kenya Malaria Strategy aims to reduce the malaria burden through spraying of the walls of targeted house structures, in order to interrupt malaria transmission and therefore the wall material is of essence. The main wall material in the households was dung, mud or sod (41 percent) with a higher proportion found in rural residences (53 percent). Wall material has an impact on density of malaria transmitting mosquito in that high density of Anopheles mosquitoes is recorded in mud houses compared to other wall surfaces such as cement, iron sheets wood etc. In addition, mud-walled surfaces have a higher chemical retention when Indoor Residual Spraying is conducted compared with cemented, wooden or iron sheet walls.

The number of rooms used for sleeping provides an indication of the extent of crowding in households and the ability to hang nets. Overall, 40 percent of household members slept in one room with over half (55 percent) being reported in urban settings and 33 percent in rural. Only 23 percent of households sleep in 3 or more rooms, with the majority being reported in the rural areas.

Percent distribution of households by housing characteristics, according to residence, Kenya 2018

	Residence		
Housing characteristic	Urban	Rural	Total
Electricity			
Yes	76.2	18.3	37.3
No	23.4	81.3	62.3
Missing	0.4	0.4	0.4
Total	100.0	100.0	100.0
Flooring material			
Earth/sand	12.5	36.5	28.6
Dung	6.5	32.1	23.7
Wood planks	0.0	0.1	0.1
Parquet or polished wood	0.1	0.0	0.0
Vinyl/PVC or asphalt strips	0.2	0.1	0.1
Ceramic tiles	12.3	2.0	5.4
Cement	61.6	27.9	39.0
Carpet	5.8	1.1	2.6
Other	0.4	0.0	0.1
Total	99.6	99.6	99.6
Main roof material			
No roof	0.1	0.0	0.0
Thatch/grass/makuti	1.4	8.5	6.2
Dung/mud/sod	0.4	0.8	0.6
Iron sheets	87.7	89.4	88.8
Tin cans	0.0	0.3	0.2
Asbestos sheet	3.8	0.2	1.4
Concrete	5.1	0.2	1.8

Tiles	1.1	0.1	0.4
Other	0.0	0.1	0.0
Total	99.6	99.6	99.6
Main wall material			
No walls	0.0	0.1	0.1
Cane/palm/trunks	0.0	0.6	0.4
Dung/mud/sod	16.0	53.2	41.0
Bamboo with mud	1.8	10.8	7.9
Stone with mud	3.9	4.0	4.0
Uncovered adobe	0.3	0.1	0.2
Plywood	0.2	0.5	0.4
Reused wood	0.0	0.3	0.2
Iron sheets	4.7	1.4	2.5
Cement	14.2	6.7	9.2
Stone with lime/cement	38.1	7.4	17.5
Bricks	8.9	7.6	8.0
Cement blocks	9.5	3.5	5.5
Covered adobe	1.2	0.7	0.9
Wood planks/shingles	0.5	2.4	1.8
Other	0.3	0.2	0.2
Total	99.6	99.6	99.6
Rooms used for sleeping			
One	55.1	32.5	39.9
Two	28.5	41.2	37.1
Three or more	15.9	25.8	22.5
Missing	0.5	0.5	0.5
Total	100.0	100.0	100.0
Number	1,392	2,855	4,247

Table 3.3: Household characteristics

3.2 Household Possessions

Possession of durable consumer goods is a useful indicator of a household's socioeconomic status. Table 3.4 shows the availability of household possessions, means of transport and ownership of agricultural land and farm animals by residence. Communication plays a key role in behavior change for net use and other interventions. In the 2018 PMLLIN survey it was found that about 88, 71 and 33 percent of the households in the selected counties own a mobile phone, a radio and a television, respectively. More households in urban areas own a mobile phone, radio and television compared to households in rural areas. This assessment is important as it presents an opportunity for communication for malaria by use of mobile messaging and radio.

Means of transport is important in accessing healthcare services and commodities. Bicycles are still the most common means of transport owned by households. Overall, 20 percent of households own a bicycle with 21 percent being in rural areas and 17 percent in urban areas.

Bicycles and motorcycles are the most owned means of transport in rural areas than urban areas compared with cars/ trucks.

The survey shows that 68 percent of the households own agricultural land, representing 85 percent of rural households and 33 percent of urban households owning land. Two in three households (64 percent) own farm animals with 81 percent hailing in rural areas and 30 percent in urban areas.

Percentage of households possessing various household effects, means of transportation, agricultural land and livestock/farm animals by residence, Kenya 2018			
	Residence		
Possession	Urban	Rural	Total
Household effects			
Radio	74.2	69.7	71.2
Television	58.0	20.1	32.5
Mobile telephone	91.4	86.4	88.0
Non-mobile telephone	2.6	1.1	1.6
Refrigerator	14.8	1.6	5.9
Solar panel	12.0	43.0	32.8
Table	88.3	90.5	89.8
Chair	89.0	95.4	93.3
Sofa	62.0	48.0	52.6
Bed	93.6	95.5	94.9
Cupboard	46.6	34.8	38.6
Clock	24.5	11.1	15.5
Watch	32.0	15.6	21.0
Microwave oven	8.0	1.0	3.3
Computer	10.9	2.3	5.1
DVD player	32.9	8.5	16.5
CD player	26.1	7.7	13.7
Means of transport			
Bicycle	17.3	21.4	20.0
Animal drawn cart	1.4	2.6	2.2
Motorcycle/scooter	8.1	9.1	8.8
Car/truck	7.9	2.7	4.4
Boat with a motor	0.5	0.4	0.4
Ownership of agricultural land	33.2	84.9	68.0
Ownership of farm animals[1]	30.3	80.5	64.1
Number	1,392	2,855	4,247
[1] Local and/or indigenous cattle, exotic/grade cattle, horses, donkeys, mules, goats, sheep, chickens, or other poultry			

Table 3.4 Household possessions

3.3: Wealth Index

The wealth index used in this report serves as a proxy for a household's standard of living. The use of household wealth index is an approach that has been demonstrated to be consistent with expenditure and income measures (Rutstein, 1999; Rutstein and Johnson, 2004). The index is constructed using household asset data collected in the Household Questionnaire and is generated via a principal components analysis.

Table 3.5 shows the distribution of the de jure household population by wealth quintiles and the Gini Coefficient, according to residence and malaria endemicity. The Gini coefficient is a statistical measure of the degree of variation or inequality represented in a set of values, used especially in analyzing income inequality. Gini coefficient of zero implies perfect equality while Gini coefficient of one implies perfect inequality. About 71 percent of urban residents are in the two highest wealth quintiles, while 84 percent rural residents are in the lowest three quintiles.

The surveys found that highland epidemic had 4 out of 10 households belonging to the lowest three quintiles. The survey further found that highland epidemic region had a quarter of the population in the lowest wealth quintile. Coast endemic zone had the highest proportion (33 per cent) of population in the highest wealth quintile while the lake endemic zone had the lowest (8 per cent) proportion of population in the highest wealth quintile.

Percent distribution of the de jure population by wealth quintiles, and the Gini Coefficient, according to residence and region, Kenya 2018

	Wealth quintile							
Residence/region	**Lowest**	**Second**	**Middle**	**Fourth**	**Highest**	**Total**	**Number of persons**	**Gini coefficient**
Residence								
Urban	4.0	9.1	16.1	28.5	42.2	99.8	5,148	0.22
Rural	32.0	30.1	21.8	13.2	2.9	100.0	14,621	0.39
Malaria endemicity								
Highland epidemic	26.6	23.0	24.2	16.7	9.4	99.9	7,546	0.35
Lake endemic	25.7	31.2	18.8	16.6	7.7	100.0	8,537	0.38
Coast endemic	18.6	12.7	15.8	19.5	33.3	100.0	3,686	0.39
Total	**24.7**	**24.6**	**20.3**	**17.2**	**13.1**	**100.0**	**19,769**	**0.32**

Table 3.5: Wealth quintiles

3.4: Household Population by Age, Sex, and Residence

The distribution of the de facto household population is shown in Table 3.6 by five-year age groups, according to sex and residence. Age and sex provide the demographics of the population which has a bearing on vulnerability to malaria infection especially pregnant women and children aged below five years. The 2018 PMLLIN Survey de facto household population constitutes 18,231 persons, of whom 49 percent are male and 51 percent are female.

Among this population, 26 percent live in urban areas and 74 live in rural areas. More than half of the population is below age 20 (55 percent). The largest proportion of the population was in the 10-14 years age group, which accounted for 16.6 per cent of the total population followed by those in the 5-9 years age group. Women of reproductive age 15-49 constituted 47 percent of the population.

Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Kenya 2018									
	Urban			Rural			All		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	11.6	12.9	12.3	11.7	11.0	11.4	11.7	11.5	11.6
5-9	12.3	12.6	12.4	16.9	15.4	16.1	15.7	14.6	15.2
10-14	13.4	12.2	12.8	18.9	17.1	18.0	17.4	15.8	16.6
15-19	11.4	9.7	10.6	12.5	12.2	12.4	12.2	11.6	11.9
20-24	7.0	10.1	8.6	6.6	7.1	6.9	6.7	7.9	7.3
25-29	7.5	12.6	10.1	4.9	6.9	5.9	5.6	8.4	7.0
30-34	9.4	7.6	8.5	4.7	5.3	5.0	6.0	5.9	5.9
35-39	7.4	6.5	7.0	4.3	4.5	4.4	5.1	5.0	5.1
40-44	5.8	4.8	5.3	3.8	4.5	4.2	4.3	4.6	4.5
45-49	4.8	3.4	4.1	4.0	3.6	3.8	4.2	3.6	3.9
50-54	3.1	1.9	2.5	2.5	3.1	2.8	2.6	2.7	2.7
55-59	2.6	1.7	2.1	2.5	2.6	2.5	2.5	2.4	2.4
60-64	1.2	1.3	1.2	2.0	1.9	2.0	1.8	1.8	1.8
65-69	1.0	0.9	0.9	1.6	1.6	1.6	1.4	1.4	1.4
70-74	0.7	0.7	0.7	1.4	1.4	1.4	1.2	1.2	1.2
75-79	0.4	0.4	0.4	1.0	0.7	0.8	0.8	0.6	0.7
80 +	0.4	0.6	0.5	0.7	0.9	0.8	0.6	0.9	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,335	2,433	4,767	6,621	6,842	13,464	8,956	9,275	18,231

Table 3.6 Household population by age, sex, and residence

Figure 2 illustrates the age-sex structure of the Kenyan population in a population pyramid. The broad base of the pyramid indicates that the majority of Kenya's population is young, with a high percentage under the age 15 of years.

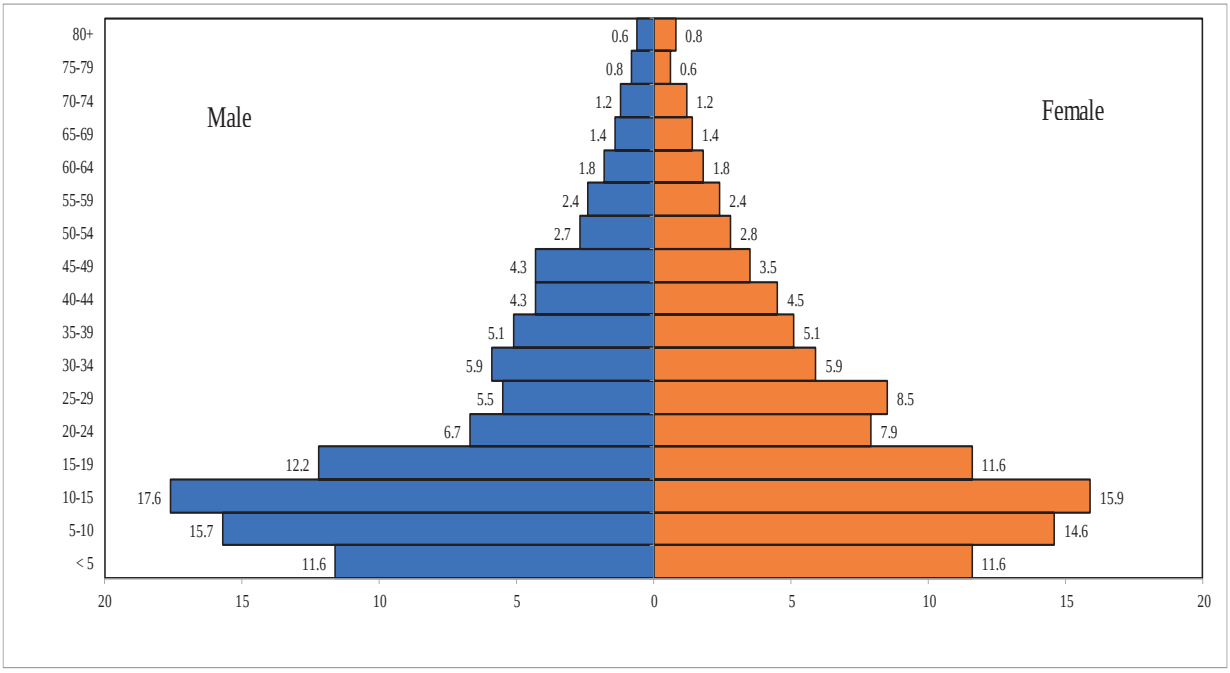


Figure 2: Population Pyramid in the 23 surveyed Counties (n=18,231)

3.5: Household Composition

The characteristics of members of the household have a bearing on health decision making, utilization of household resources on health and vulnerability to diseases. Information on key aspects of the composition of households is presented in Table 3.7 and indicate that a slightly higher proportion of urban than rural households are headed by women (28 percent and 26 percent, respectively).

The survey shows that the highest proportion of the household heads (26 percent) was in the 30–39 age bracket. Overall the mean household size was 4.7 with the rural households having a higher mean household size (5.1 people) compared to urban households (3.7 people).

Percent distribution of households by sex of head of household and by household size; and mean size of household, according to residence, Kenya 2018			
	Residence		
Characteristic	Urban	Rural	Total
Household headship			
Male	71.5	73.4	72.8
Female	27.9	26.2	26.8
Total	100.0	100.0	100.0
Age of household head			
Less than 20	0.8	1.0	1.0
20-29	20.2	10.1	13.4
30-39	33.9	22.4	26.2
40-49	22.9	24.0	23.6
50-59	11.7	16.5	15.0
60-69	5.5	12.9	10.4
70 or over	4.3	12.7	10.0
Total	100.0	100.0	100.0
Number of usual members			
1	20.9	6.9	11.5
2	13.1	7.5	9.3
3	14.2	10.9	12.0
4	17.4	15.8	16.3
5	13.9	17.7	16.5
6	9.5	15.3	13.4
7	5.5	9.8	8.4
8	2.9	7.0	5.7
9+	2.2	8.7	6.6
Total	100.0	100.0	100.0
Mean size of households	3.7	5.1	4.7
Number of households	1,392	2,855	4,247
Note: Table is based on de jure household members, i.e., usual residents.			

Table 3.7 Household composition

CHAPTER 4: LLIN COVERAGE AND USE

Key Findings

- Eighty-three (83) percent of households surveyed own at least one long-lasting insecticidal net (LLIN).
- Fifty-one (51) percent of households surveyed had attained universal coverage (1 LLIN per every two people sleeping in the household).
- Seventy-five (75) percent of the household population surveyed had access to an LLIN.
- Sixty-six (66) percent of the household members slept under an LLIN the night before the survey.
- Ninety-one (91) percent of members of households with at least one LLIN for every two people slept under an LLIN the night before the survey.
- Seventy- three (73) percent of children under age five slept under an LLIN the night before the survey
- In households with at least an LLIN, the use by children under 5 is 88 percent
- Seventy-five (75) percent of pregnant women slept under an LLIN the night before the survey, and 97 percent of pregnant women slept under an LLIN in households with one or more LLIN for every two people
- More than 98 percent of household respondents are confident that they can hang a net, feel that it is important and safe for children to sleep under a net.
- Fifty-six (56) percent of households say they would never use a bed net for purposes other than for sleeping.
- Ninety-one (91) percent agree they could hang a net anywhere people sleep in their house.
- Sixty (60) percent strongly/somewhat agree that people are at risk of getting malaria throughout the year.

This chapter presents information on ownership and use of LLINs and other mosquito nets by household members as well as progress towards attainment of universal coverage (the proportion of households with at least one net for every two people), source and cost of nets, access to nets, and net condition.

4.1 Household Ownership of Mosquito Nets

4.1.1 Ownership of Mosquito Nets

All households were interviewed on net ownership and were also asked to show the mosquito nets in their possession to the interviewer for brand identification. In Kenya, though LLINs are recommended for malaria prevention, other varieties of treated and untreated nets may be found in households. Household ownership of LLINs and other nets is shown in Table 4.1 below.

In the counties surveyed, the proportion of households owning at least one LLIN was 83 percent. Ownership varied by endemicity with the lake endemic at 85 percent, highland epidemic at 83 percent and Coast endemic at 77 percent. The proportion of households with at least one LLIN for every two people (universal coverage) was 51 percent with 55 percent of HH in the highland epidemic zone, followed by 54 percent in the coast endemic and 47 percent in the lake endemic zones reporting this. The average number of LLINs per household at the time of the survey was 2.4, with the highest being reported in the lake endemic, at 2.6 with Coast endemic having the lowest at 2.3. Households in the rural setup were more likely to own at least one mosquito net by 91 percent as compared to urban with 83 percent. Moreover 86 percent of the rural households had at least one LLIN compared to those in the urban with 77 percent. There was little difference in the percentage of households with a child aged under five years who had at least one LLIN either in rural (89 percent) or urban (87 percent) areas. The average number of LLIN per household increased to 2.4 compared to 1.8 in PMLLIN 2017 with the highest increase being reported in Coast endemic from (1.3 to 2.3).

Table 4.1 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated), more than one net, and at least one long-lasting insecticidal net (LLIN); percentage of households with a child under age five with at least one mosquito net (treated or untreated), more than one net, and at least one LLIN,; average number of nets and of LLINs per household; and percentage of households with at least one net and the percentage with at least one LLIN per two persons who stayed in the household last night, by background characteristics, Kenya 2018

	Percentage of households with:			Percentage of households with a child under age five with			Average number of nets per household			Percentage of households with at least one mosquito net for every two persons who stayed in the household last night[1]		
Background characteristic	At least one mosquito net	More than one mosquito net	At least one long- lasting insecticidal net (LLIN)	At least one mosquito net	More than one mosquito net	At least long- lasting insecticidal net (LLIN)	Any mosquito net	Long- lasting insecticidal net (LLIN)	Number of households	Any mosquito net	Long- lasting insecticidal net (LLIN)	Number of households with at least one person who stayed in the household last night
Residence												
Rural	90.6	72.9	85.9	92.5	79.9	89.0	2.7	2.5	2,855	56.8	50.8	2,757
Urban	82.7	53.3	76.6	92.2	70.4	86.8	2.2	2.1	1,392	57.8	52.4	1,363
Malaria endemicity												
Highland epidemic	87.3	67.0	83.2	88.6	76.1	85.0	2.5	2.4	1,645	59.3	54.6	1,603
Lake endemic	91.4	70.6	85.4	95.5	79.2	90.9	2.6	2.4	1,699	54.0	46.5	1,639
Coast endemic	82.7	58.1	77.4	93.3	75.0	89.5	2.5	2.3	904	59.2	54.4	879
Wealth quintile												
Lowest	88.1	69.1	80.9	87.9	73.8	81.9	2.7	2.5	865	49.2	42.9	832
Second	92.5	73.9	87.0	93.0	79.3	89.9	2.7	2.5	951	56.0	50.6	919
Middle	87.7	72.6	84.3	95.3	84.1	91.1	2.6	2.5	849	58.9	52.9	812
Fourth	91.8	70.5	87.0	95.3	77.8	91.4	2.6	2.4	754	62.9	56.0	744
Highest	79.5	45.5	74.8	92.5	69.3	90.3	2.0	1.9	826	60.0	55.0	813
Total	88.0	66.5	82.8	92.4	77.2	88.4	2.5	2.4	4,247	57.2	51.3	4,120

[1] De facto household members

4.1.2: Trends of LLINs ownership in PMLLIN 2017 and PMLLIN 2018 surveys

Figure 3 shows the trends of LLIN ownership in the PMLLIN 2017 and PMLLIN 2018 surveys. The proportion of ownership at least one LLIN increased in the Highland epidemic zone, from 76 to 83 percent, Lake Endemic from 83 to 85 percent and from 63 to 77 percent in Coast Endemic. Proportion of household reaching universal coverage (one net for every two people in a household) increased from 47 to 51 percent in the counties participating in the mass net distribution. There was an increase from 49 to 55 percent in highland epidemic, 39 to 54 percent in Coast endemic but a decrease from 50 to 47 percent in Lake Endemic.

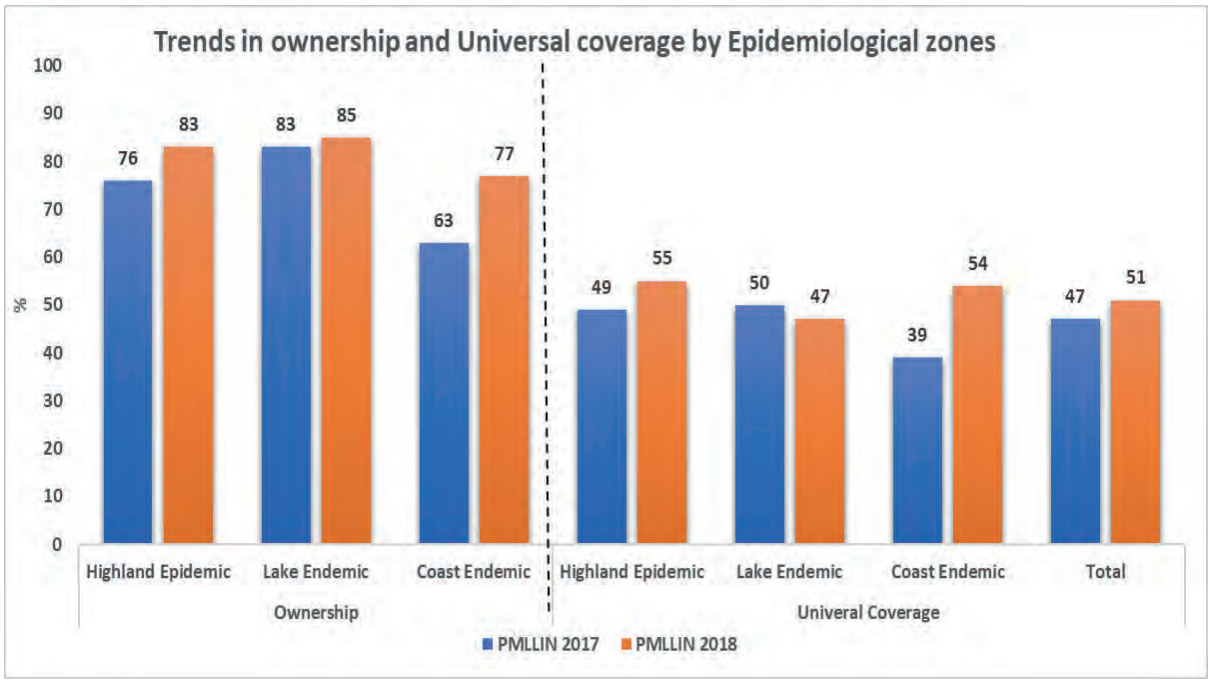


Figure 3: Trends of Universal coverage LLINs ownership in 2017 and 2018, by epidemiological zone

Universal coverage increased across all strata of residence, endemicity (except Lake Endemic) and wealth quintile as shown in figure 4.

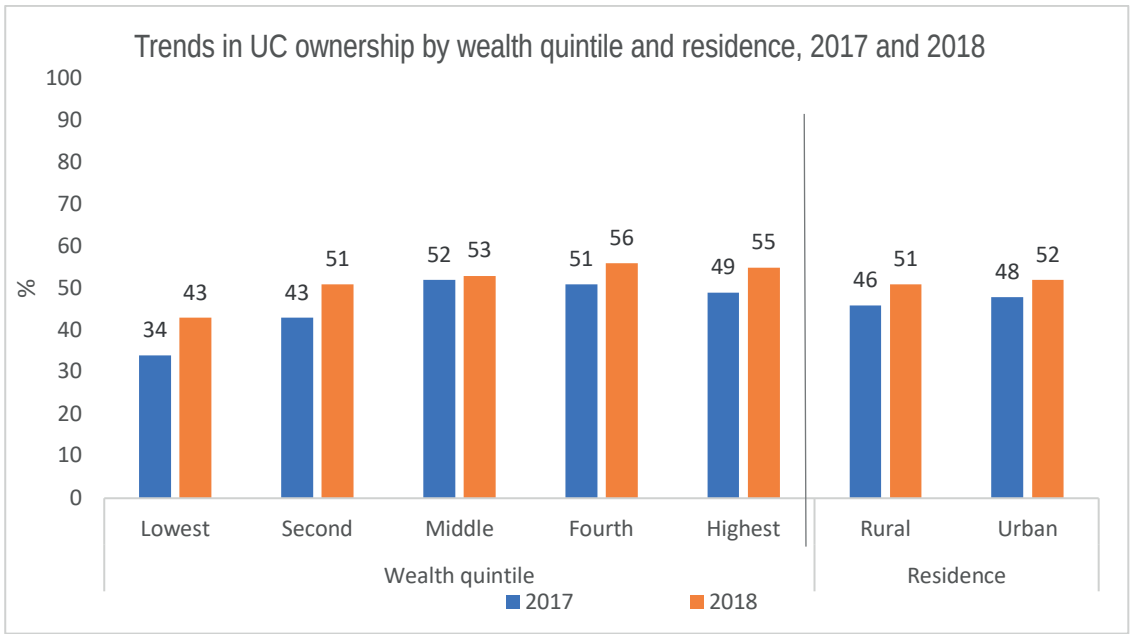


Figure 4: Ownership of one LLIN for every two people in the Household by strata

4.1.3 Source and Cost of Mosquito Nets

Table 4.2 shows the percent distribution of mosquito nets by source and by cost of net and the mean cost of net, according to background characteristics. Seventy-four percent of nets were acquired from mass campaign. Eight percent of nets were received through routine continuous distribution in government or FBO clinics or hospitals.

Overall, three percent of nets were reported to have been obtained from supermarkets or retail shops, and 2 percent from dukas and rural shops. Households in the coast endemic zone were more likely to report having accessed nets from markets and shops than households in other malaria transmission zones. Households in the highest wealth quintile were also more likely to have obtained nets from markets and shops, with 17 percent of nets in households in the highest wealth quintile having been accessed from supermarkets.

Most nets (94 percent) were accessed for free, while another three percent were purchased for 500 Kenyan Shillings or less. Ninety-seven percent of nets in rural areas were accessed for free compared with 83 percent of nets in urban areas. In the coast endemic zones, fewer nets were accessed free (89 percent) compared to the highland epidemic (95 percent) or lake endemic zones (95 percent). More nets were purchased by households in the highest wealth quintile (23 percent) compared to 0.7 percent in the lower wealth quintile households. Among nets that were not free, the mean cost was KES. 729.

Table 4.2: Source and cost of mosquito nets

	Percent distribution of mosquito nets by source of net, percent distribution by cost of net, and mean cost of net, according to Background characteristics, Kenya 2018																		
	Source of net									Cost of net									Number of mosquito nets
Background characteristic	2017-18 campaign	Other campaign	Government/ FBO Clinic/ Hospital	Duka/ Rural shop	Supermarket/ retail shop	Friends/ relative	Other	Don't know	Total	Free	1-500 KSH	501+ KSH	Not sure	Total		Mean cost of nets[1]	Number of Nets that were bought	
Residence																			
Rural	79.5	9.6	6.8	1	0.8	1.1	0.5	0.7	100	97.4	1.3	0.7	0.6	100		478	140	6,924
Urban	59.5	9.3	11.4	4.7	9.7	2.6	2	0.8	100	83.4	6	9.2	1.5	100		819	390	2,567
Malaria endemicity																		
Highland epidemic	80.5	9	5.1	0.5	2.1	1.1	0.5	1.1	100	94.6	2.8	1.4	1.2	100		559		3,623
																	151	
Lake endemic	73	10.9	7.3	1.8	3.6	1.4	1.5	0.5	100	94.7	1.6	3.2	0.4	100		821		4,037
																	197	
Coast endemic	63.7	7.6	15.7	5.3	4.6	2.3	0.3	0.5	100	89	4.3	5.6	1.1	100		771		1,831
																	181	
Wealth quintile																		
Lowest	78.6	9.9	8.9	0.7	0	0.6	0.3	1	100	98.1	1.2	0	0.7	100		182	25	2,023
Second	79.9	9.8	7	0.8	0.5	1	0.5	0.3	100	98.2	1.4	0.3	0.1	100		361	38	2,346
Middle	80.5	8.2	6.6	1	1	1.6	0.2	0.8	100	96.2	2.1	0.5	1.1	100		304	50	1,952
Fourth	71.3	12.2	7.7	2.5	2.7	1.6	1.4	0.5	100	93.5	2.9	2.8	0.9	100		639	105	1,822
Highest	51.4	6.9	11.3	6.6	16.7	3.1	2.9	1.1	100	75.1	7	16	1.8	100		920	311	1,344
Total	74.1	9.5	8.1	2	3.2	1.5	0.9	0.7	100	93.6	2.6	3	0.8	100		729	530	9,491
	FBO = Faith-based organization, [1] Mean excludes free nets and nets for which the price is not known																	

4.1.4 Access to Long-Lasting Insecticidal Nets

Table 4.3 presents the percent distribution of households by the number of LLINs the household owns and percentage of the people in those households with access to an LLIN, according to number of persons who stayed in the household the night before the survey. About 91 percent of the population in the area targeted by the mass net distribution slept in homes with the different LLINs. Only nine percent of the population slept in homes without any LLINs the night before the survey. By transmission zone, the lake endemic had the lowest proportion of the population in households without any LLINs (5 percent), while the proportion was almost double in the highland epidemic (11 percent) and Coast endemic zones (12 percent).

The proportion of people with access to an LLIN was 75 percent across all epidemiological zones surveyed. By transmission zone, the Highland epidemic and Lake endemic zones had higher proportions of the population in smaller households (one to four residents) with adequate numbers of nets, while the coast endemic had higher proportions of the population with adequate numbers of nets in households with five to seven persons. A lower proportion of persons staying in households with one member, or in households with six or more members, had access to LLINs

Percent distribution of the de facto household population by number of LLINs the household owns, and percentage with access to an LLIN, according to number of persons who stayed in the household the night before the survey, Kenya 2018

	Number of persons who stayed in the household the night before the survey								
Number of LLINs	1	2	3	4	5	6	7	8+	Total
Surveyed areas									
0	31.6	18.2	8.5	8.0	7.6	8.6	7.7	7.3	8.9
1	53.1	38.8	28.9	20.0	10.4	7.5	10.1	11.8	15.2
2	12.4	31.6	36.0	39.6	31.5	25.9	19.8	17.0	26.6
3	1.8	7.4	19.6	22.2	31.6	29.9	26.3	20.4	24.0
4	0.5	2.1	5.5	8.7	12.9	17.4	18.9	21.3	14.6
5	0.5	2.0	1.0	1.0	3.4	5.8	8.8	7.1	4.8
6	0.0	0.0	0.4	0.3	1.8	2.6	4.6	10.0	3.8
7+	0.0	0.0	0.0	0.3	0.9	2.4	3.8	5.0	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	488	791	1,526	2,769	3,496	3,411	2,491	4,796	19,769
Percent with access to an LLIN[1]	68.4	81.8	81.9	82.0	79.9	77.8	72.8	64.1	75.1
HIGHLAND EPIDEMIC									
0	26.7	13.8	8.4	9.0	9.9	10.9	10.9	12.0	11.1
1	57.0	38.9	22.9	16.0	11.9	3.7	8.6	8.4	13.1
2	12.5	37.1	41.0	41.2	26.4	27.3	22.4	16.4	27.0
3	1.4	7.6	20.3	22.0	32.0	32.0	29.2	20.4	24.7
4	1.1	1.2	6.2	9.6	13.7	15.7	16.3	22.9	14.5
5	1.2	1.4	0.6	1.9	5.1	6.9	5.1	7.7	5.0
6	0.0	0.0	0.6	0.3	0.6	3.2	3.3	8.9	3.3
7+	0.0	0.0	0.0	0.0	0.5	0.3	4.3	3.4	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	209	310	590	1,061	1,351	1,274	968	1,782	7,546
Percent with access to an LLIN[1]	73.3	86.2	84.0	83.0	77.7	77.5	69.2	62.7	74.5

LAKE ENDEMIC									
0	23.2	19.7	7.8	7.6	4.8	6.8	4.4	1.1	5.4
1	56.5	35.5	32.1	24.6	10.0	10.0	12.8	15.3	16.4
2	17.7	31.0	33.6	40.7	35.7	28.9	21.2	18.7	28.2
3	2.6	6.1	19.4	19.5	33.6	24.9	20.9	19.6	22.7
4	0.0	4.5	5.1	7.3	9.5	19.7	19.3	21.7	15.0
5	0.0	3.1	1.5	0.3	2.3	3.7	11.6	6.8	4.6
6	0.0	0.0	0.5	0.0	3.2	1.4	6.8	11.7	4.8
7+	0.0	0.0	0.0	0.0	1.0	4.5	3.0	5.0	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	113	250	559	1,097	1,567	1,603	1,106	2,241	8,537
Percent with access to an LLIN[1]	76.8	80.3	81.5	80.1	82.1	76.9	74.4	66.9	75.7
COAST ENDEMIC									
0	43.5	22.6	9.7	7.0	9.8	8.4	9.5	14.7	12.4
1	45.9	42.1	33.5	18.8	7.8	8.8	6.1	9.5	16.4
2	8.8	24.8	32.0	34.7	31.9	13.7	10.0	13.3	21.9
3	1.9	8.3	18.8	27.3	25.2	39.6	33.8	22.8	25.3
4	0.0	0.8	5.0	9.5	20.2	14.1	24.1	16.7	13.6
5	0.0	1.4	0.9	0.6	2.4	9.5	10.4	6.7	4.6
6	0.0	0.0	0.0	0.7	0.9	4.6	1.7	7.4	2.7
7+	0.0	0.0	0.0	1.2	1.9	1.4	4.5	8.8	3.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	166	230	377	611	578	534	417	772	3,686
Percent with access to an LLIN[1]	56.5	77.4	79.1	83.5	79.2	81.2	77.0	59.4	74.7
[1] Percentage of the de facto household population who could sleep under an LLIN if each LLIN in the household were used by up to two people									

Table 4.3 Household population with access to an LLIN

Figure 5 shows the percentage of de facto household population with access to an LLIN in the household, assuming each LLIN in the household is used by up to two people, by residence, malaria endemicity, and wealth quintile. Overall the proportion of population with access to an LLIN increased from 70 percent in PMLLIN 2017 to 75 percent in PMLLIN 2018 with the highest increase recorded in

coast endemic and lowest in lake endemic.

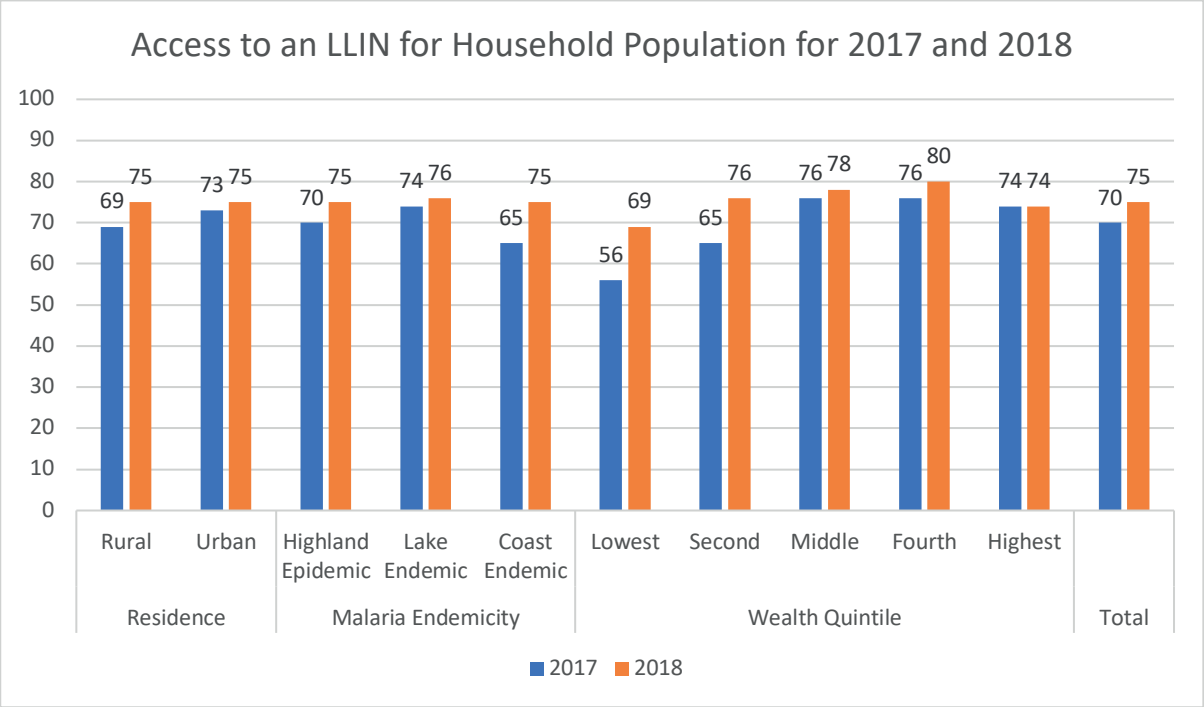


Figure 5: Access to an LLIN by the household population

4.2: Use of Mosquito Nets

The use of mosquito nets is the primary preventive intervention for malaria control. Community-level protection against malaria helps reduce the spread of the disease and offers an additional level of protection against malaria for the most vulnerable groups, such as children aged below 5 years and pregnant women. Table 4.4 shows use of mosquito nets by persons in the households. The proportion of the population sleeping under an LLIN in households that have attained universal coverage (1 LLIN for every 2 people) increased from 88% in 2017 to 91% in 2018. The proportion of the population sleeping under an LLIN in households with at least one LLIN was nearly the same in 2017 (87.5 percent) as in 2018 (86.9 percent). About 73 percent of children aged below five years slept under an LLIN the night before the survey while 96 percent attained universal coverage use. House hold members aged between 5 and 34 years were less likely to sleep under an LLIN at 62 percent and a universal coverage use of 89 percent.

Percentage of the de facto household population who slept under a mosquito net (treated or untreated) the night before the survey and the percentage who slept under a long-lasting insecticidal net (LLIN); among the de facto household population in households with at least one LLIN, the percentage who slept under an LLIN the night before the survey; and among the de facto household population in households with at least one LLIN for every two people the percentage who slept under an LLIN the night before the survey by background characteristics, Kenya 2018.

	Household population			Household population in households with at least one LLIN[1]		Household population in households with at least one LLIN for every two people (universal coverage)	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an LLIN last night	Number	Percentage who slept under an LLIN[1] last night	Number	Percentage who slept under an LLIN last night in households with an LLIN for every two people	Number
Age							
<5	73.8	73.0	2193	88.1	1603	95.6	900
5-14	63.0	62.6	6200	87.9	3895	91.2	2545
15-34	61.4	60.9	6556	85.9	4007	87.1	2866
35-49	75.8	75.0	2658	86.9	2003	91.7	1292
50+	75.7	75.1	2161	86.4	1626	92.3	1183
Sex							
Male	64.0	63.4	9857	86.5	6272	88.9	4298
Female	69.5	69.0	9911	87.4	6861	92.1	4490
Residence							
Rural	66.3	65.8	14632	88.2	9662	90.0	6295
Urban	67.8	67.2	5154	83.2	3471	91.9	2492
Malaria endemicity							
Highland epidemic	68.4	67.9	7547	85.5	5143	91.9	3503
Lake endemic	63.8	63.1	8553	89.7	5417	88.0	3450
Coast endemic	70.0	69.7	3686	83.1	2574	92.8	1835
Wealth quintile							
Lowest	60.0	59.2	4882	82.6	2897	89.2	1713
Second	67.9	67.6	4871	89.4	3293	88.6	2138
Middle	69.9	69.5	4034	89.4	2815	92.7	1955
Fourth	69.5	68.9	3393	90.8	2351	89.9	1665
Highest	68.7	67.9	2606	81.2	1777	93.1	1316
Total	**66.7**	**66.2**	**19,786**	**86.9**	**13,133**	**90.5**	**8,787**

Table 4.4 Use of mosquito nets by persons in the household

In figure 6 there was a notable increase in LLIN use in household that have attained universal coverage in coast endemic region.

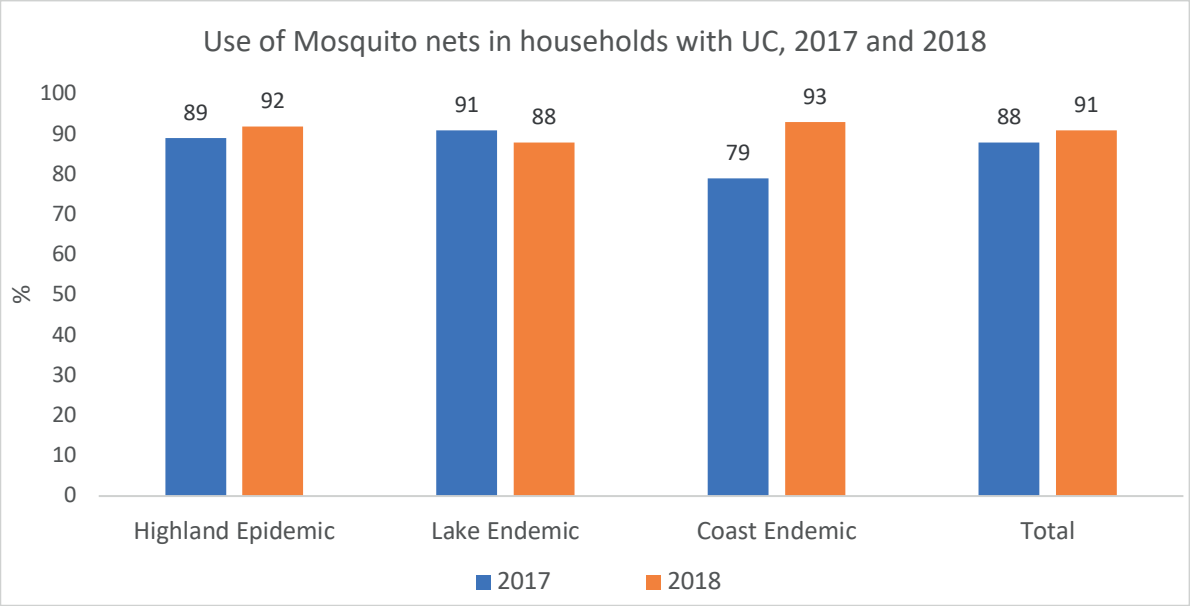


Figure 6: Use of LLINs in Households that have achieved universal coverage

4.2.1. Use of existing LLINs

Table 4.5 shows the percentage of LLINs used in the household by anyone the night before the survey, by background characteristics. Seventy-six percent of LLINs were used the night before the survey in households with available LLINs.

Percentage of long-lasting insecticidal nets (LLINs) that were used by anyone the night before the survey, by background characteristics, Kenya 2018

Background characteristic	Percentage of existing LLINs used last night	Number of LLINs
Residence		
Rural	75.8	6,924
Urban	77.2	2,567
Malaria endemicity		
Highland epidemic	78.6	3,623
Lake endemic	73.3	4,037
Coast endemic	77.7	1,831
Wealth quintile		
Lowest	72.8	2,023
Second	74.0	2,346
Middle	80.5	1,952
Fourth	76.0	1,822
Highest	78.9	1,344
Total	76.2	9,491

Table 4.5 Use of existing LLINs

The use of existing LLINs was highest in middle wealth quintile and lowest in lowest wealth quintile at 81 and 73 percent respectively while the highest malaria endemicity zone was the highland epidemic at 79 percent of LLINs were used.

4.2.2: Use of mosquito nets by children

Table 4.6 shows percentage of children under five years of age who, the night before the survey, slept under a mosquito net (treated or untreated), the percentage who slept under a long-lasting insecticidal net (LLIN); use in households with at least one LLIN, and the percentage who slept under an LLIN the night before the survey, by background characteristics. In the surveyed counties, 73 percent of the children slept under an LLIN the night before the survey. In households with universal coverage, 97 percent of children under age 5 years slept under an LLIN, with the highest being reported in the Coast endemic zone at 97 percent.

Percentage of children under five years of age who, the night before the survey, slept under a mosquito net (treated or untreated), the percentage who slept under a long-lasting insecticidal net (LLIN); and among children under five years of age in households with at least one LLIN, the percentage who slept under an LLIN the night before the survey, by background characteristics, Kenya 2018

	Children under age 5 in all households			Children under age 5 in households with at least one LLIN		Children under age 5 living in households with at least one LLIN for every two people (universal coverage)	
Background characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an LLIN last night	Number of children	Percentage who slept under an LLIN last night	Number of children	Percentage who slept under an LLIN last night in households with an LLIN for every two people	Number
Age (in months)							
<12	85.8	84.7	186	91.0	173	98.4	81
12-23	76.8	76.1	460	87.1	402	95.9	185
24-35	71.8	70.3	453	80.5	396	96.1	166
36-47	74.3	73.5	486	84.7	422	95.3	226
48-59	69.1	68.8	608	77.7	539	94.5	242
Sex							
Male	74.9	73.9	1087	84.4	952	95.3	453
Female	72.8	72.2	1106	81.6	979	96.0	447
Residence							
Rural	74.1	73.4	1580	82.8	1401	95.8	643
Urban	73.1	72.2	613	83.4	530	95.2	257
Malaria endemicity							
Highland epidemic	70.2	69.5	849	82.3	718	94.7	354
Lake endemic	75.2	74.0	890	80.8	815	95.7	352
Coast endemic	77.9	77.7	454	88.6	398	97.1	193
Wealth quintile							
Lowest	66.8	64.9	604	79.5	493	96.3	188
Second	75.8	75.5	555	83.6	501	94.9	236
Middle	75.8	75.6	411	83.7	371	95.5	206
Fourth	74.4	74.3	340	82.4	306	94.5	139
Highest	81.3	80.3	284	87.8	260	97.4	130
Total	**73.8**	**73.0**	**2193**	**83.0**	**1931**	**95.6**	**900**

Note: Table is based on children who stayed in the household the night before the interview.

Table 4.6 Use of mosquito nets by children

4.2.3: Use of mosquito nets by pregnant women

This survey also presents the percentage of pregnant women aged 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated) and the percentage who slept under a long-lasting insecticidal net (LLIN); among pregnant women age 15-49 in households with at least one LLIN, the percentage who slept under an LLIN the night before the survey; and, among pregnant women in households with at least one net for every two people, the percentage who slept under an LLIN the night before the survey, by background characteristics, PMLLIN 2018.

Overall, 74 percent of pregnant women slept under an LLIN the night before the survey in all households. The highest was in the Lake endemic zone where 76 percent of pregnant women were reported sleeping under an LLIN the night before the survey. For households that have attained universal coverage, 97 percent of pregnant women in lake endemic region reported sleeping under an LLIN the night before the survey.

	Among pregnant women age 15-49 in all households			Among pregnant women age 15-49 in households with at least one LLIN		Pregnant women living in households with at least one LLIN for every two people	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an LLIN last night	Number of women	Percentage who slept under an LLIN last night	Number of women	Percentage who slept under an LLIN last night in a household with an LLIN for every two people	Number
Residence							
Urban	74.5	72.6	323	86.7	236	97.4	145
Rural	76.1	76.1	151	82.8	115	96.1	88
Malaria endemicity							
Highland epidemic	73.5	73.1	166	81.5	121	94.6	77
Lake endemic	77.7	75.5	216	90.7	164	99.1	110
Coast endemic	71.2	70.8	92	80.1	65	95.6	47
Wealth quintile							
Lowest	69.9	68.6	126	79.2	87	93.9	54
Second	73.6	72.1	108	87.1	78	97.9	47
Middle	82.9	80.5	83	90.9	68	95.0	43
Fourth	71.4	70.6	83	88.2	58	99.0	37
Highest	80.9	80.9	74	84.7	60	99.3	52
Total	**75.0**	**73.7**	**473**	**85.4**	**351**	**96.9**	**233**

Table 4.7 Condition of mosquito nets in households

4.2.4 Mosquito Net Condition

The survey established the household population who slept under mosquito nets with no holes, or those that had holes smaller than a thumb, or holes larger than thumb but smaller than fist/hand, or holes larger than fist but smaller than a head, or holes larger than a head. It found out that sixty-seven percent of all the nets used the night before the survey did not have holes on inspection by the survey team. Fourteen percent of all the nets had holes smaller than a thumb or finger (0.2-2cm). The highest proportion of all nets having holes larger than a person's head (more than 25cm diameter or circumference) were in the lake endemic zone at 6.0 percent compared to 4.7 percent in coast endemic and 2.6 percent in highland epidemic (Table 4.8). As noted in table 1.4, the time interval between the distribution and the survey was shortest for the coast endemic zone (10 months) and longest for five of eight counties in the lake endemic zone (up-to 16 months). More nets with holes were found in households in the second wealth quintile (36 percent) than in any other quintile, with the lowest proportion of nets with holes found in the highest wealth quintile (31 percent). Comparing results from this survey to the one done in 2017 (figure 7, the proportion of nets without holes did not change by much, except in the coast endemic zone, when the proportion with no holes increased significantly from 52 percent in 2017 to 77 percent in 2018

Percent distribution of the de facto household population who slept under a mosquito nets with no holes and with varying sizes of holes.

Background characteristic	No holes	Hole smaller than a thumb/finger 0.2-2 cm	Hole larger than thumb but smaller than fist/ hand 2-10 cm	Hole larger than fist but smaller than head 10-25 cm	Hole larger than head, more than 25 cm	Number of nets
Residence						
Rural	66.8	14.1	9.8	5.1	4.2	6,871
Urban	66.8	13.3	9.7	5.2	5.0	2,538
Malaria endemicity						
Highland epidemic	69.8	16.9	7.9	2.9	2.6	3,600
Lake endemic	59.3	13.6	13.1	8.0	6.0	3,987
Coast endemic	77.3	8.4	6.1	3.5	4.7	1,821
Wealth quintile						
Lowest	67.6	12.7	9.6	6.3	3.8	2,005
Second	64.2	13.0	12.2	5.5	5.1	2,329
Middle	65.8	15.8	8.8	4.6	5.0	1,938
Fourth	68.4	13.2	8.7	4.8	4.8	1,804
Highest	69.1	15.3	8.6	4.0	2.9	1,328
Total	66.8	13.9	9.8	5.2	4.4	9,408

Note: If more than one hole is present, only the largest hole was recorded.

Table 4.8 Condition of mosquito nets in households

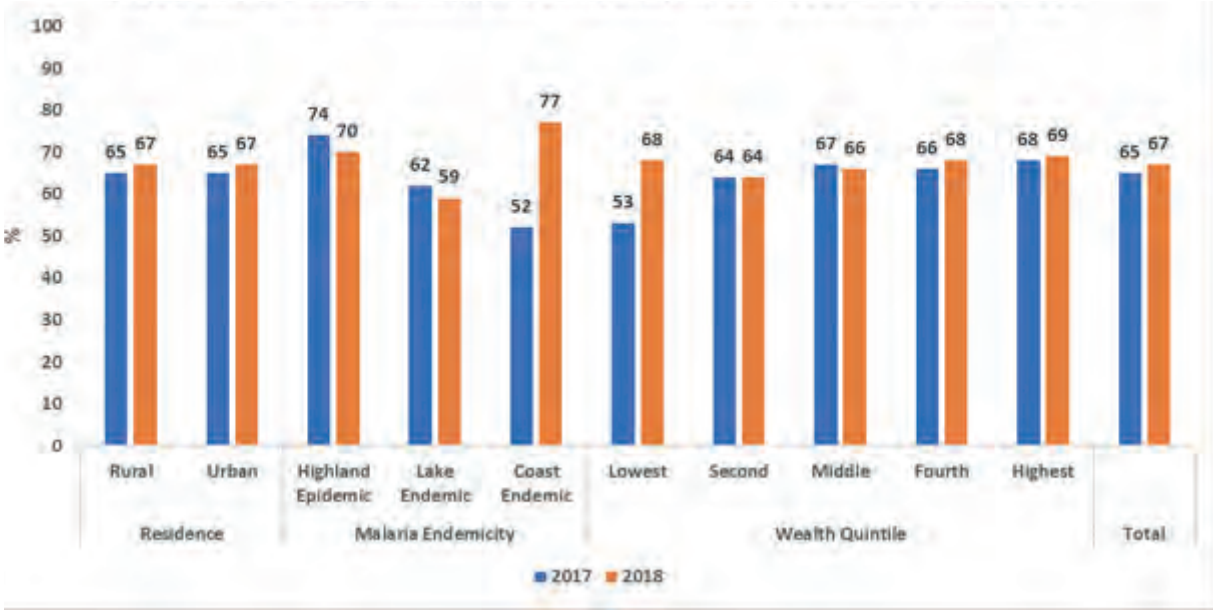


Figure 7: Proportion of mosquito nets with no holes

As shown in Table 4.9, thirty-two percent of household respondents mentioned that community members use LLINs for other purposes, and regarding disposal, 28 percent reported they burned nets, 17 percent reported they put nets in a garbage dump, and four percent reported burying nets. Fourteen percent of household respondents reported giving away nets, and only 4 percent reported selling nets, in the 12 months preceding the survey. A further dive on recycling of nets by endemicity finds most households in the highland epidemic zone reported recycling nets (35 percent), while most households in the lake endemic zone reported burning nets (37 percent), and most households in the coast epidemic zone reported putting nets in a garbage dump (32 percent).

Percentage of households who have given away a mosquito net in the past 12 months and who have sold a mosquito net in the past 12 months; the percent distribution of households who report their community uses nets for purposes other than sleeping by net type; and the method of net disposal by households, by Background characteristics, Kenya 2018									
	Percentage who have given away a mosquito net in past 12 months	Percentage who have sold a mosquito net in past 12 months	Net disposal						
Background characteristic			Recycle	Bury	Garbage or refuse dump	Burnt	Don't know	Not applicable (didn't have LLINs to dispose)	Number of households
Residence									
Rural	13.8	4.1	36.4	3.2	13.3	31.0	1.8	13.9	2,855
Urban	15.0	4.3	23.5	5.7	23.8	21.6	2.1	22.9	1,392
Malaria endemicity									
Highland epidemic	14.7	8.2	35.2	2.7	12.0	25.9	1.9	22.2	1,645
Lake endemic	16.3	2.3	32.7	5.5	13.1	36.7	1.7	9.4	1,699
Coast endemic	9.5	0.4	25.8	3.8	32.0	15.1	2.4	21.0	904
Wealth quintile									
Lowest	10.3	1.6	36.6	2.6	10.0	32.1	2.1	16.6	865
Second	13.2	2.8	38.6	3.4	13.6	29.2	2.1	13.2	951
Middle	16.0	7.1	38.7	4.9	12.1	26.1	1.2	14.9	849
Fourth	17.5	5.6	26.6	4.4	15.9	33.5	1.9	17.7	754
Highest	14.7	4.2	18.7	5.2	32.6	19.0	2.1	22.5	826
Total	**14.2**	**4.2**	**32.2**	**4.1**	**16.7**	**27.9**	**1.9**	**16.8**	**4,247**

Table 4.9. Net retention and disposal of non-usable nets

4.3. Attitudes towards Mosquito Nets

Attitudes among the population towards mosquito nets influences net access and use. Respondents in the 2018 PMLLIN survey were asked a number of questions about their attitudes towards mosquito nets and malaria risk, the results of which are presented in Table 4.10 and compared with the 2017 survey in Figure 8.

Findings of the PMLLIN 2018 survey show that more than 95 percent are extremely/very confident they can hang a net compared to 93 percent in 2017, over 98 percent feel that it is extremely or very important for young children to sleep under a net. Ninety-one percent agree that treated mosquito nets are safe to sleep under. These attitudes did not vary substantially by transmission zone except for the one on seasonality and timing of getting malaria infection which is substantially low, at 28 percent. Generally, all these attitudes have improved over time since the 2017 PMLLIN survey.

Fifty-six percent of households said they would never use a bed net for purposes other than for sleeping compared to 74 percent in 2017. Opinions in support of never using a net for alternative purposes ranged from 46 percent among households in the Lake endemic zone to 66 percent of households in coastal endemic zone. About 91 percent agree they could hang a net anywhere people sleep in their house compared to 87 percent in 2017. Agreement about hanging a net anywhere in one's house ranged from 90 percent in the highland epidemic to 92 percent in coastal endemic compared to 80 percent in lake endemic zone to 90 percent in the Coast endemic zone in 2017.

About eight in 10 households (84 percent) felt that most people in their community slept under a net every night. Finally, two fifths (40 percent) of the proportion of household respondents who incorrectly reported that people are at risk of getting malaria only during the rainy season decreased from 67 percent in 2017 to 40 percent in 2018. The lowest proportion of respondents agreeing that malaria can only be caught in the rainy season was 28 percent, in the lake endemic zone, compared to 55 percent of household respondents in the highland epidemic zone.

Percentage of household respondents reporting specific attitudes related to mosquito nets, 2018				
	Malaria endemicity			Total
	Highland epidemic	Lake endemic	Coast endemic	
Extremely /very confident in hanging a net	95.1	94.4	95.7	95.0
Extremely/very important for young children to sleep under a net	97.4	98.4	97.0	97.7
Never use bed net other than for sleeping	59.3	46.0	66.3	55.5
Strongly/somewhat agree that treated nets are safe	93.9	90.1	89.1	91.3
Strongly/somewhat agree that most people in community sleep under an ITN every night	86.1	88.7	85.4	87.0
Strongly/somewhat agree you can hang a net anywhere	90.2	90.7	92.2	90.8
Strongly/somewhat agree that people are at risk of getting malaria only during rainy season	54.5	28.3	37.0	40.3
Number of households	1,645	1,699	904	4,247

Table 4.10 Attitudes towards mosquito nets

Attitudes towards net use

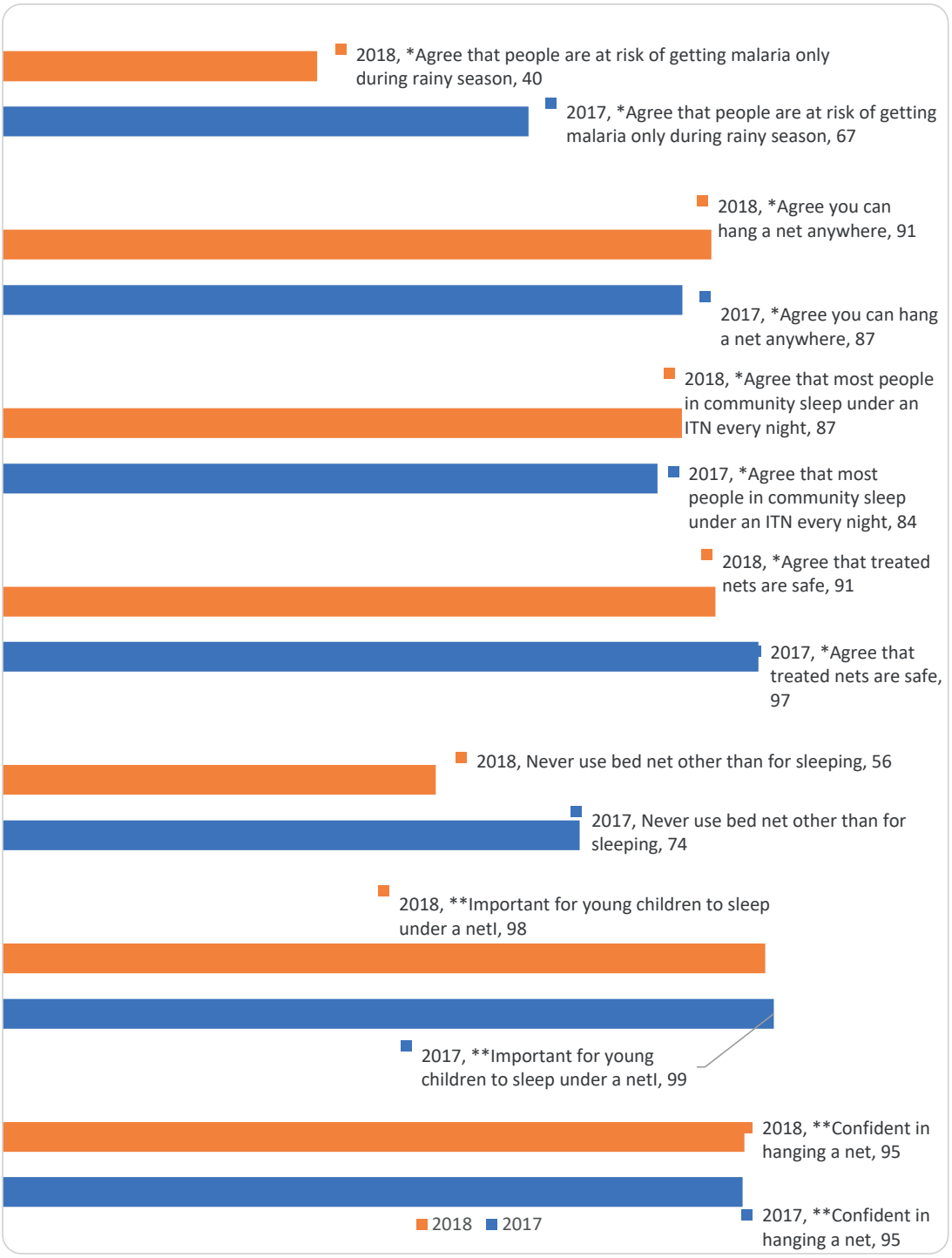


Figure 8: Attitudes towards net use

Major Highlights:

Fifty-six percent of households say they would never use a bed net for purposes other than for sleeping compared to 74 percent in 2017.

Eighty-seven percent of the community members sleep under an ITN every night with 91 percent accepting that they can hang a net anywhere.

CHAPTER 5: PROCESS EVALUATION OF THE 2017/2018 MASS LLIN CAMPAIGN

Key Findings

- Overall, 77 percent of households reported that they were registered in the 2017/2018 mass net campaign.
- Seventy-six percent of households reported they collected their net from the distribution point.
- Among those who did not collect their nets, 38 percent reported being absent, 29 percent reported not being visited by registrar while 20 percent reported not being aware of the distribution dates.
- Average number of nets distributed per household was reported by households to be three across urban and rural settings. On average, each household reported having 3 nets in possession
- For households that did not receive nets, 39 percent reported they failed to get nets because there were no nets available at the time of visiting the distribution centres, 11 percent reported they were turned away while about three percent reported that the waiting time was too long so they could not wait any longer

5.1: Evaluation of Mass LLIN Campaign

5.1.1 Process outcome of LLIN distribution campaign

The process of the LLIN mass distribution campaign was evaluated by determining the proportion of households that reported that they were registered during the 2017 /18 mass distribution campaign, finding out if someone visited their household to register the number of household members, determining if someone from the household was sent to distribution points to collect the nets and if not the survey sought to determine reasons for failing to send someone to collect nets and/or reasons for not going to receive nets. The survey ascertained the number of nets still in the household's possession after mass net distribution campaign. Kakamega and Busia counties were issued with vouchers during the net distribution campaign. This survey confirmed if the households were given a voucher for net collection.

5.1.2 Household registration and collection of nets

As indicated in Table 5.1, 77 percent of households reported that they were registered in the last campaign with a lower proportion of registered households being reported in urban (62 percent) than in rural households (84 percent) and a lower proportion (65 percent) in coast endemic zone. Respondents in households not registered most often stated the reason for not being registered as being absent during the registration (38 percent), followed by not being visited (29 percent) and 28 percent were not aware of the registration activity. Variations were observed in reasons for non-registration between urban and rural households with more rural households reporting not being visited by the registration team (35 percent) compared with urban households who 'did not know about the registration' as the most proffered reason at 30 percent.

Seventy-six percent of household respondents reported that they collected their nets from the distribution point. Among those who reported not having collected their nets, 36 percent said they were absent, 27 percent said their household had not been registered while 20 percent said they were not aware of the distribution dates. The proportion who said they did not have the time or means to reach the distribution point was much lower (5 percent) than what was reported during the 2017 PMLLIN survey (23 percent).

House Holds		Rural		Urban	Malaria endemicity						Total	
					Highland epidemic		Lake endemic		Coast endemic			
		Per cent	House holds	Per Cent	House Holds	per cent	House holds	per cent	House holds	per cent	House holds	per cent
Household registered to receive nets last year	Yes	2396	84.3	862	62.2	1253	76.3	1421	84.4	584	64.6	3258	77.0
	No	381	13.4	456	32.9	314	19.1	240	14.2	283	31.4	837	19.8
	Don't know	66	2.3	69	4.9	76	4.6	22	1.3	36	4.0	134	3.2
	Total	2843	100	1386	100	1643	100	1683	100	904	100	4229	100
The reason household was not registered	Absent	139	36.5	180	39.6	106	33.6	102	42.6	112	39.6	320	38.2
	Refused	0	0.0	2	.5	2	.6	1	.2	0	0.0	2	.3
	Not visited by registrar	135	35.3	106	23.3	102	32.5	70	29.1	69	24.3	241	28.8
	Did not know about the registration	95	24.9	138	30.3	95	30.3	49	20.5	89	31.3	233	27.8
	Other	13	3.3	29	6.3	9	3.0	18	7.6	14	4.8	41	4.9
	Total	381	100	456	100	314	100	240	100	283	100	837	100

Table 5.1: Household registration and reasons for not registering, PMLLIN 2018

5.1.3 Mean number of vouchers, LLINs received at the distribution points

Vouchers were issued in two counties; Kakamega and Busia. In these two counties, 92 percent of the households reported receiving vouchers that allowed them to collect LLINs, as shown in table 5.2. The voucher was used as an accountability document as well as an IEC material that provided information encouraging net use at the household. In both urban and rural settings, a mean of three nets was distributed to each household with 23 percent of households receiving four or more nets at the distribution point.

When asked why the household did not receive nets, 39 percent of the respondents reported no nets were available when they visited the distribution points, 11 percent reported that staff at the distribution point refused to give them nets while about three percent of the respondents reported that the waiting time was too long and they could not wait until they could receive nets. 'other' was coded as the reason for not receiving nets, the description sometimes indicated that the household was absent during registration, that at the time of distribution nets were missing, that the campaign did not reach their village, that the household members did not have identification cards required for registration or that the household members forgot.

Table 5.2: Mean number of vouchers received at the distribution points, PMLLIN 2018

Households		Rural		Urban	Malaria endemicity						Total	
					Highland epidemic		Lake endemic		Coast endemic			
		per cent	House holds	per cent	House holds	per cent	House holds	per cent	House holds	Per cent	House holds	per cent
Household member collected nets in a 2017-18 campaign distribution point	Yes	2367	83.3	840	60.6	1276	77.7	1348	80.1	583	64.5	3207	75.8
	No	429	15.1	524	37.8	342	20.8	298	17.7	313	34.6	952	22.5
	Don't know	47	1.7	23	1.6	24	1.5	38	2.2	8	.9	70	1.7
	Total	**2843**	**100**	**1386**	**100**	**1643**	**100**	**1683**	**100**	**904**	**100**	**4229**	**100**
Reason not going to a distribution point	No time	13	3.0	36	6.9	16	4.7	12	4.1	20	6.6	49	5.1
	Means	5	1.2	0	0.0	3	1.0	1	.3	1	.2	5	.6
	Not interested	6	1.5	22	4.2	15	4.4	5	1.7	8	2.6	28	3.0
	Forgot or missed the date	26	6.0	16	3.1	14	4.0	20	6.6	9	2.8	42	4.4
	Not aware of the date	67	15.6	118	22.6	55	16.1	54	18.0	77	24.5	185	19.5
	Was absent	155	36.1	190	36.3	121	35.3	113	37.9	111	35.6	345	36.2
	Household not registered	137	32.0	122	23.2	106	31.1	77	25.9	76	24.2	259	27.2
	Others (specify)	19	4.5	20	3.7	12	3.5	16	5.4	11	3.5	39	4.1
	Total	**429**	**100**	**524**	**100**	**342**	**100**	**298**	**100**	**313**	**100**	**952**	**100**
Received nets at a distribution point	Yes	2297	94.4	799	90.6	1231	93.8	1304	93.1	561	93.2	3096	93.4
	No	137	5.6	83	9.4	81	6.2	97	6.9	41	6.8	220	6.6
	Total	2434	100	882	100	1312	100	1401	100	602	100	3316	100
Received vouchers at a distribution point	Yes	264	94.8	31	73.6	0	0.0	296	92.0	0	0.0	296	92.0
	No	14	5.2	11	26.4	0	0.0	26	8.0	0	0.0	26	8.0
	Total	**279**	**100**	**42**	**100**	**0**	**0**	**321**	**100**	**0**	**0**	**321**	**100**
Number of nets received	1	236	10.3	162	20.4	177	14.4	141	10.8	79	14.2	398	12.9
	2	694	30.3	269	33.8	406	33.1	394	30.2	163	29.1	963	31.2
	3	723	31.5	206	25.9	341	27.8	409	31.4	179	31.9	929	30.1
	4+	641	27.9	158	19.9	303	24.7	358	27.5	138	24.8	799	25.9
	Total	**2294**	**100**	**794**	**100**	**1227**	**100**	**1302**	**100**	**559**	**100**	**3088**	**100**
Reason not receiving nets at a distribution point	No nets available at this time	60	44.0	26	31.0	37	45.9	40	41.0	9	21.0	86	39.1
	Waiting time too long	4	3.2	1	1.6	1	1.5	2	2.3	2	5.5	6	2.6
	They refused to give nets	11	8.4	12	14.2	9	11.6	7	7.7	6	15.5	23	10.6
	Other	45	32.5	33	39.9	21	25.3	37	37.9	20	49.1	78	35.3
	Don't know	16	11.9	11	13.3	13	15.7	11	11.1	4	8.9	27	12.4
Total		**137**	**100.0**	**83**	**100.0**	**81**	**100.0**	**97**	**100.0**	**41**	**100.0**	**220**	**100.0**

5.1.4: Mean number of nets remaining in the household and reasons why other nets are no longer in the household.

		Rural	Urban	Malaria endemicity			Total
			Highland epidemic	Lake endemic	Coast endemic		
Number of remaining nets in the household	Mean number of nets	3	2	2	2	2	2
	Median number of nets	2	2	2	2	2	2
	Households	2855	1392	1645	1699	904	4247
Net was stolen	Households	6	6	2	8	2	12
	per cent	1.1	3.2	.9	2.2	1.5	1.6
Net was destroyed accidentally	Households	174	44	40	159	20	218
	per cent	31.6	24.6	16.9	41.6	17.1	29.8
Net was sold	Households	0	0	0	0	0	0
	per cent	0.0	0.0	0.0	0.0	0.0	0.0
Net was given away	Households	291	111	139	194	69	403
	per cent	52.8	61.9	59.3	51.0	59.8	55.1
Other	Households	103	27	58	42	30	130
	per cent	18.7	14.9	24.6	11.1	25.7	17.7

Table 5.3: Distributed nets no longer owned by Household, PMLLIN 2018

The mean number of nets given through the mass net distribution process that were still present in households across all the malaria endemicity and urban was two while rural areas had an average of three nets. Asked for reasons why nets were no longer owned by the households, the respondents reported that 55 percent of absent nets had been given away, that 30 percent had been accidentally destroyed, that only about 2 percent had been stolen and that none of the nets had been sold.

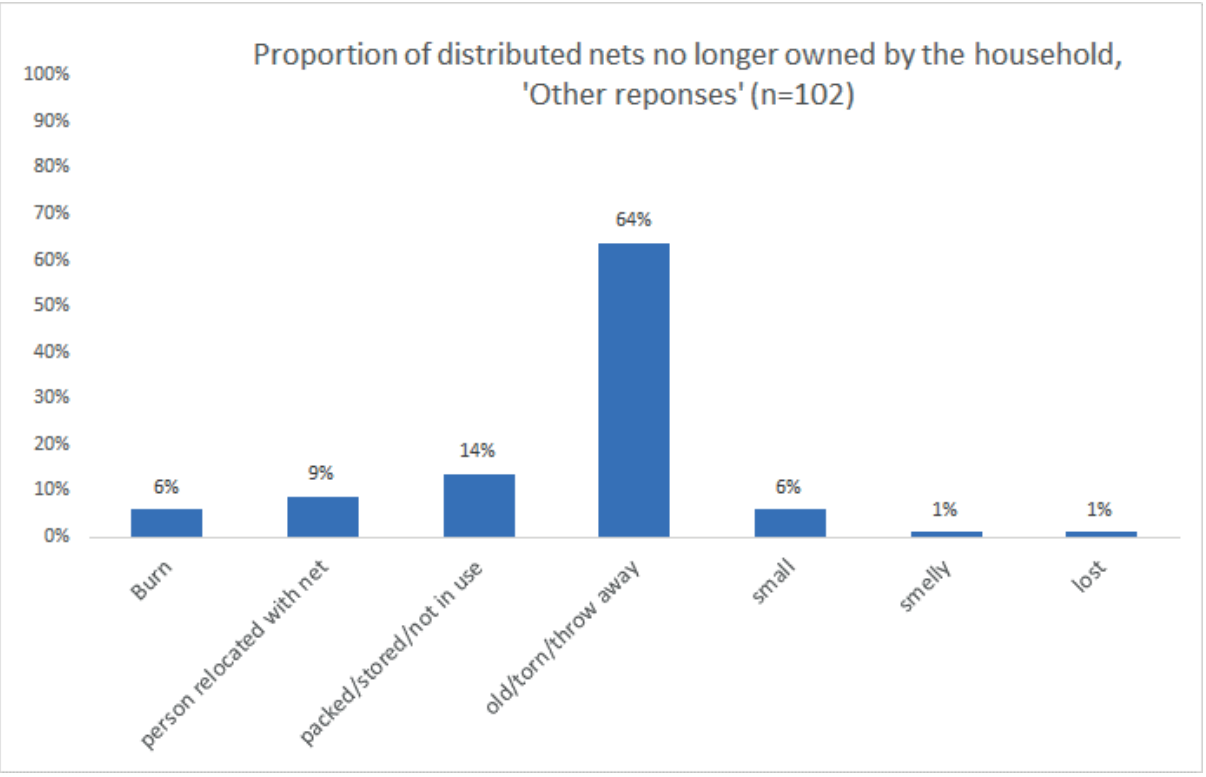


Figure 9: Proportion of distributed nets no longer in use owned by the household (Other responses '18%')

Among the responses stated as ['Other' = accounts for 18% of all responses], 64% reported that the nets were old/torn and thrown away while 14% reported that the net were still packed. Nine percent reported that the household members relocated to other areas with the net and 6% reported that the net was too small.

5.2: IEC Communication during the mass net distribution campaign

5.2.1: IEC communication

Communication was an integral part of the entire mass net distribution process including planning, implementation and post distribution. Multiple channels were used to convey messages about the mass net distribution such as Inter-personal communication through community mobilizers, chiefs and village elders who passed information to community members. Road shows, use of public address systems and IEC materials e.g. T-shirts, caps, bags, umbrellas and posters with specific dates for registration and distribution were also used.

Table 5.4 shows the range of communication methods used during 2017/18 LLIN mass campaign, according to place of residence, malaria endemicity, and social economic status. Eighty- five percent of respondents reported having heard about the 2017/18 mass net distribution campaign. Eighty-nine percent of the rural households reported having heard about the mass distribution of LLIN compared to 77 percent in urban areas. The proportion that reported to having heard about the campaign by zone was 89 percent in the lake endemic, 85 percent in Highland epidemic and 78 percent in Coast Endemic. The most likely means of hearing about the exercise was through community leaders, reported by 49 percent of the household respondents, an increase of 8 percent from the 2017 PMLLIN survey. The proportion of household respondents reporting having heard about the exercise by radio also increased from 22 percent (in 2017) to 39 percent (in 2018). The proportion reporting that they heard about the distribution through home visits also increased from 19 percent in 2017 to 30 percent in 2018. Respondents were least likely to have received campaign messages through posters (3 percent).

	Rural		Urban		Malaria endemicity						Wealth index quintiles										Total	
	Count	per cent	Count	per cent	Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest		Count	per cent
					Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent		
Poster	82	3.2	42	3.9	63	4.5	50	3.3	11	1.6	19	2.5	22	2.6	22	3.0	37	5.8	24	3.9	124	3.4
Radio	986	39.0	414	38.6	514	36.9	833	55.7	52	7.4	249	32.7	354	41.2	325	44.4	267	41.9	205	33.7	1400	38.9
Roadshow	156	6.2	97	9.1	48	3.4	183	12.2	23	3.2	40	5.3	49	5.7	58	7.9	65	10.2	42	6.8	253	7.0
Public address system	127	5.0	59	5.5	29	2.1	118	7.9	39	5.6	33	4.4	45	5.2	44	6.0	38	5.9	26	4.3	186	5.2
Chief's barazas	605	23.9	295	27.5	398	28.6	299	20.0	203	28.6	172	22.6	187	21.9	210	28.7	165	25.8	165	27.2	900	25.0
Health workers	662	26.2	203	18.9	281	20.1	467	31.2	117	16.6	202	26.5	224	26.2	154	21.0	151	23.7	134	22.0	865	24.0
Home visit during registration	820	32.5	251	23.5	273	19.6	625	41.8	173	24.5	214	28.1	352	41.1	187	25.5	177	27.7	142	23.3	1071	29.8
Community leaders	1399	55.4	360	33.6	630	45.2	818	54.7	312	44.1	467	61.3	468	54.6	373	50.9	265	41.6	186	30.6	1760	48.9
Family/friends	271	10.7	160	14.9	145	10.4	195	13.1	90	12.7	91	12.0	76	8.8	80	10.9	86	13.5	97	16.0	430	12.0
Other	44	1.7	22	2.1	30	2.2	30	2.0	5	.7	14	1.8	15	1.7	12	1.6	12	1.9	14	2.2	66	1.8
Total	2525	100.0	1072	100.0	1394	100.0	1496	100.0	708	100.0	762	100.0	857	100.0	733	100.0	637	100.0	608	100.0	3597	100.0

Table 5.4: Source of communication, PMLLIN 2018

5.2.2: Communication content

Further, the respondents were asked to state the content of the information they had heard or seen about mass net distribution as shown in Table 5.5. Get registered (jiandikishe) was the highest with 85 percent, followed by Go collect your net (pata net) with 77 percent. Sleep under your net every night scored 42 percent while hang net under shade for 24 hours before using for the first time scored 16 percent and about 13 percent of the respondents heard that after washing their net they should not hang in direct sun light (to hang in shade). Limited information about net use and maintenance was being given at the distribution posts. There is need to encourage the distribution staff at the posts to give this information every time.

5.2.3: Demonstration on net hanging

Previously, NMCP and other partners had carried out campaigns on net hanging. Table 5.6 shows the distribution of information on the net hanging campaign according to place of residence, malaria endemicity, and social economic status.

When respondents were asked whether they had seen a demonstration on how to hang a mosquito net for the last one year, about half (49 percent) said a demonstration had occurred in their community whereby eighty- six percent of them confirmed to having attended a net hanging demonstration, as shown in Table 5.6.

5.2.4: Any other communications on mosquito net use or malaria prevention

Table 5.7 shows the distribution of any other communication on mosquito net use in the past one year, according to place of residence, malaria endemicity, and social economic status. About 69 percent of household respondents confirmed to having heard malaria communications messages. Of those, 90 percent reported that they had heard the messages on the radio and almost all (99 percent) said that the messages included the phrase "lala ndani ya neti kila siku kila msimu". In addition 60 percent of household respondents reported that they had seen messages about net use or malaria prevention in their community.

	Rural		Urban		Malaria endemicity						Wealth index quintiles										Total	
	Count	per cent	Count	per cent	Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest		Count	per cent
					Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent		
Get registered (jiandikishe)	2133	84.4	941	87.8	1190	85.4	1281	85.6	602	85.1	633	83.1	721	84.1	626	85.4	551	86.6	542	89.1	3073	85.4
Go collect your net (pata net)	1958	77.5	813	75.8	1017	73.0	1274	85.2	480	67.9	589	77.3	683	79.6	565	77.1	487	76.5	448	73.5	2771	77.0
Sleep under your net every night	1198	47.4	320	29.9	340	24.4	1018	68.0	160	22.6	318	41.8	467	54.5	335	45.7	246	38.7	151	24.8	1518	42.2
Keep your net far from fire keep your net clean, but when net is dirty wash	101	4.0	41	3.8	20	1.4	114	7.6	8	1.1	34	4.4	32	3.7	35	4.8	25	3.9	16	2.7	141	3.9
With water and normal soap	116	4.6	48	4.5	38	2.7	123	8.2	3	.4	35	4.7	36	4.3	33	4.5	29	4.6	30	5.0	164	4.6
After washing your net do not hang in direct sun light (hang in shade)	344	13.6	120	11.2	106	7.6	349	23.3	9	1.3	94	12.4	134	15.6	100	13.6	70	11.1	66	10.8	464	12.9
Hang net under shade for 24 hours before using for the first time	442	17.5	115	10.7	120	8.6	411	27.4	26	3.7	125	16.3	194	22.6	116	15.8	70	11.0	54	8.8	557	15.5
Other	49	1.9	10	1.0	5	.3	53	3.5	1	.2	17	2.3	19	2.2	7	1.0	13	2.0	3	.4	59	1.6
Total	2525	100.0	1072	100.0	1394	100.0	1496	100.0	708	100.0	762	100.0	857	100.0	733	100.0	637	100.0	608	100.0	3597	100.0

Table 5.5: Communication content, PMLLIN 2018

Count		Rural		Urban	Malaria endemicity						Wealth index quintiles										Total	
		per cent	Count	per cent	Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest		Count	per cent	
					Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent			
In your community, was there a demonstration on how to hang a mosquito net in the last one year?	Yes	1540	54.2	543	39.2	830	50.5	975	57.9	278	30.8	447	51.8	540	56.8	455	54.7	370	48.9	271	32.7	2083	49.3
	No	1304	45.8	843	60.8	813	49.5	708	42.1	625	69.2	416	48.2	411	43.2	376	45.3	386	51.1	558	67.3	2146	50.7
Did you attend the net hanging demonstration?	Yes	1342	87.2	440	81.1	713	85.9	850	87.2	220	79.2	378	84.4	478	88.6	409	90.0	308	83.3	209	77.2	1783	85.6
	No	198	12.8	103	18.9	117	14.1	125	12.8	58	20.8	70	15.6	62	11.4	45	10.0	62	16.7	62	22.8	301	14.4
Total number of households		2843	100.0	1386	100.0	1643	100.0	1683	100.0	904	100.0	863	100.0	951	100.0	831	100.0	755	100.0	829	100.0	4229	100.0

Table 5.6: Net hang up demonstration, PMLLIN 2018

Count		Rural		Urban	Malaria endemicity						Wealth index quintiles									Total	
		per cent	Count	per cent	Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest		Count	per cent	
					Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent			
Have you heard or seen any other communications on mosquito net use or malaria prevention in the past year?	Yes	2041	71.8	874	63.1	1180	71.8	1365	81.1	370	40.9	530	61.4	716	75.3	633	76.1	546	72.3	490	59.2	2915	68.9
	No	803	28.2	512	36.9	463	28.2	318	18.9	534	59.1	333	38.6	235	24.7	198	23.9	210	27.7	339	40.8	1315	31.1
Did you hear the messages about net use or malaria prevention on the radio?	Yes	1814	88.9	804	92.0	1089	92.3	1221	89.5	308	83.2	459	86.5	621	86.6	577	91.2	505	92.5	457	93.3	2619	89.8
	No	226	11.1	70	8.0	91	7.7	144	10.5	62	16.8	71	13.5	96	13.4	56	8.8	41	7.5	33	6.7	296	10.2
Did any of the messages you heard on the radio include the phrase "lala chini ya neti kila siku kila msimu"?	Yes	1802	99.3	797	99.1	1075	98.7	1218	99.7	307	99.6	455	99.3	619	99.7	573	99.2	503	99.6	450	98.4	2599	99.3
	No	13	.7	7	.9	15	1.3	4	.3	1	.4	3	.7	2	.3	4	.8	2	.4	8	1.6	20	.7
Did you see messages about net use or malaria prevention in your community?	Yes	1803	63.4	717	51.8	1101	67.0	1172	69.6	247	27.4	491	56.9	616	64.8	566	68.1	470	62.2	377	45.5	2521	59.6
	No	1040	36.6	669	48.2	542	33.0	511	30.4	656	72.6	372	43.1	335	35.2	265	31.9	285	37.8	451	54.5	1709	40.4
Total		2843	100.0	1386	100.0	1643	100.0	1683	100.0	904	100.0	863	100.0	951	100.0	831	100.0	755	100.0	829	100.0	4229	100.0

Table 5.7: communication content, PMLLIN 2018

5.3: Net care

Respondents were asked if they had washed their nets. For those who had washed them they were asked how often they did so in the preceding six months to the survey, what was used in addition to water during the last wash and where the nets were dried. The following sub-sections show the results for each.

5.3.1: Net washing

The effectiveness of LLIN is determined by many factors including the frequency of washing, what is used in addition of water for washing the LLIN, how the LLIN is dried after washing, etc. The WHO prequalification is that an LLIN typically must still meet criteria for effectiveness with cone bioassays (>=80% mortality or >=95% knock-down) after 20 washes which translates to roughly one wash every two-three months during actual use. The studies of nets found in households in the coast endemic zone found significantly greater physical deterioration with higher washing frequency independent of the age of the net (Mutuku,2013). Moreover, Atieli et al (2010) noted that washing of LLINs at short time intervals using local washing methods after only 10 washes rendered them ineffective in preventing local vectors from feeding through the net material.

Asked if they had washed their nets, 54 percent of respondents reported they had done so while 45 percent reported they had not yet washed their nets. Of those who reported washing their nets, 60 percent lived in urban areas while 52 percent lived in rural areas. Households in coastal endemic were more likely to wash their nets (69 percent reported doing so), followed by lake endemic (59 percent) and highland epidemic with 43 percent reporting doing so (figure 10).

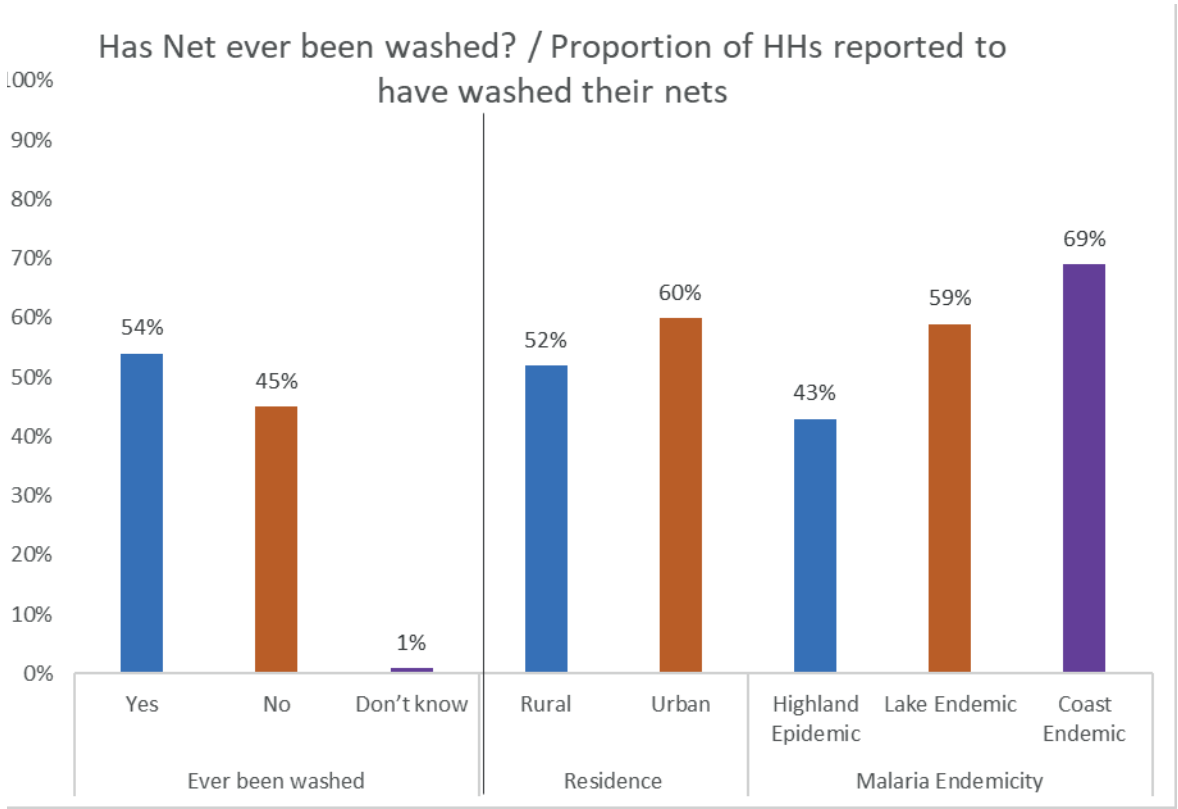


Figure 10: If Net was ever washed and Proportion of HHs reported to have washed their Nets

5.3.2: Frequency of net washing

Figure 11 shows the number of times mosquito nets were reported to have been washed in the six months before the survey date. Most of the nets (67 percent) had been washed twice or less during the six months, roughly the frequency assumed when testing for WHO pre-qualification of a net. Of nets washed more frequently than twice in the past six months, just under half were washed three times and the remaining nets four times or more. Rates of washing were roughly similar by urban / rural setting and transmission zone, except a higher proportion of nets in the coast endemic zone (40%) had been washed three or more times.". In the coast endemic region, slightly more than a quarter (28%) of the nets had been washed more than three times in the 6 months before the survey.

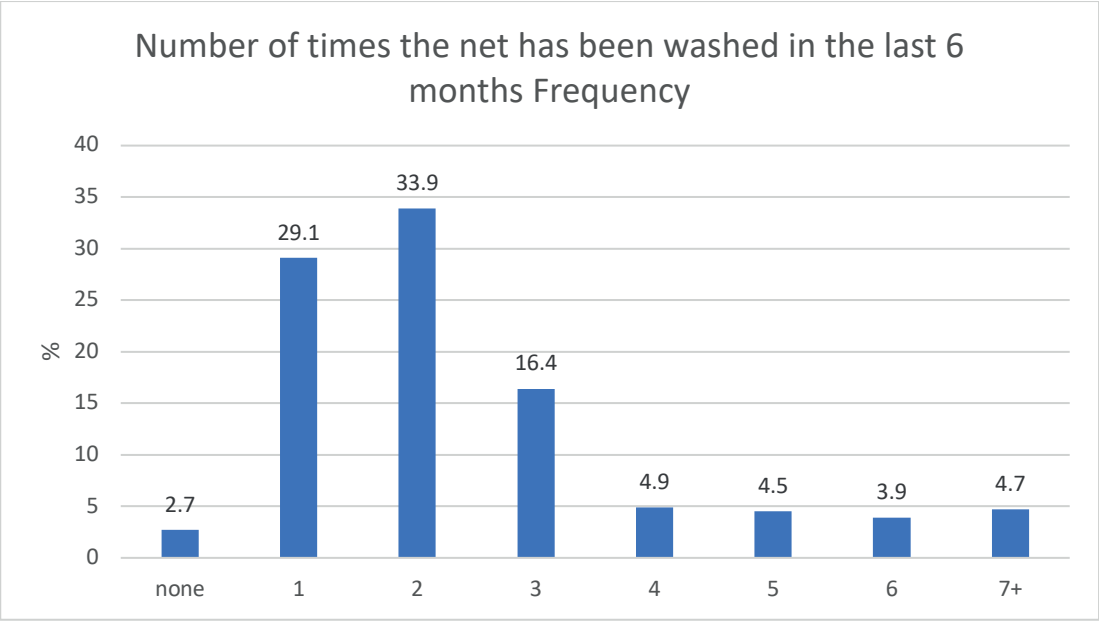


Figure 11: Number of times the net had been washed in the last 6 months

5.3.3: What was used in addition to water when washing the mosquito nets

Respondents who reported to have washed their nets were asked what they used in addition to the water. Table 5.8 shows that about 57 percent of them reported to have used bar soap, followed by 40 per cent who reported to have used a detergent and only about three per cent reported using a mixture of the bar soap and the detergent.

5.3.4: Where net was dried

The survey inquired about where the mosquito net was dried after washing. About 60 per cent of respondents reported drying nets outside on a cloth-hanging line while 23 per cent reported drying them outside on the ground as shown in Table 5.9.

	Total		Rural		Urban		Malaria endemicity						Wealth index quintiles									
							Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest	
	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent
Bar soap	2863	55.6	2242	62.2	620	40.2	879	56.3	1639	69.3	345	28.2	596	56.9	741	64.6	688	66.4	567	52.5	271	32.3
Detergent	2051	39.8	1206	33.4	845	54.8	603	38.6	595	25.2	854	69.8	397	37.9	358	31.2	312	30.1	470	43.5	514	61.3
Bleach	13	.2	10	.3	2	.2	3	.2	6	.3	3	.2	1	.1	5	.4	2	.2	1	.1	3	.3
Mix	146	2.8	90	2.5	56	3.6	54	3.4	91	3.9	1	.1	33	3.1	22	1.9	26	2.5	27	2.5	38	4.5
Nothing	60	1.2	47	1.3	13	.8	16	1.0	26	1.1	18	1.5	19	1.8	13	1.2	6	.5	13	1.2	10	1.2
Dont know	17	.3	12	.3	5	.3	7	.5	7	.3	2	.2	2	.1	8	.7	3	.3	1	.1	4	.4
Total	5149	100.0	3608	100.0	1542	100.0	1562	100.0	2364	100.0	1224	100.0	1048	100.0	1147	100.0	1037	100.0	1079	100.0	839	100.0

Table 5.8: For the last wash, what was used in addition to water?

	Total		Rural		Urban		Malaria endemicity						Wealth index quintiles									
							Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Outside on the ground	1172	22.8	935	25.9	238	15.4	380	24.3	690	29.2	102	8.3	272	25.9	335	29.2	266	25.6	201	18.7	98	11.7
Outside on line	3102	60.2	1924	53.3	1178	76.4	846	54.2	1318	55.8	937	76.6	493	47.1	553	48.2	620	59.8	754	69.9	681	81.2
Outside bush or fence	688	13.4	600	16.6	88	5.7	275	17.6	306	12.9	107	8.7	249	23.7	204	17.8	121	11.6	92	8.5	22	2.7
Other (specify)	188	3.6	150	4.2	38	2.5	61	3.9	49	2.1	77	6.3	34	3.3	55	4.8	31	3.0	31	2.9	37	4.4
Total	5149	100.0	3608	100.0	1542	100.0	1562	100.0	2364	100.0	1224	100.0	1048	100.0	1147	100.0	1037	100.0	1079	100.0	839	100.0

Table 5.9: Where was the net dried

5.4: Net hanging for sleeping

5.4.1: Net hanging for sleeping

Net hanging is a prerequisite for people to sleep under them and be protected. As shown in figure 12, 75 percent of nets were found to be hanging for sleeping on the day of survey. Of the nets that were hanging, 75 per cent were in rural while 25 per cent were in urban settings. Households in the highland epidemic zone had the highest percentage of household respondents reporting net hanging (81 per cent) followed by Coastal endemic with 73 percent and the least was lake endemic with 71 per cent. Households members in the lowest and second lowest wealth quintiles were the least likely to report having hanged nets at 70 per cent and 71 per cent, respectively, compared to 79 percent in the richest households.

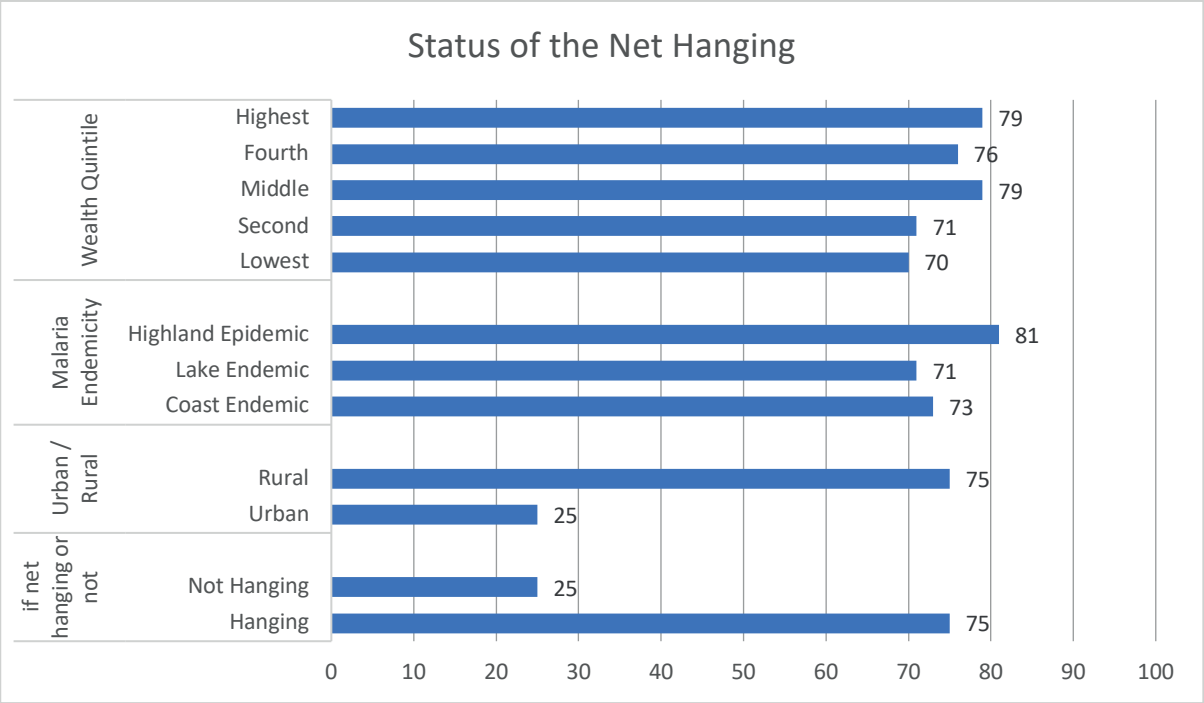


Figure 12: Status of Net Hanging and Proportion of Nets that were hanging for sleeping by strata

5.4.2: Reasons for not hanging the net

Table 5.10 shows the reasons why the net was not hanging for sleeping on the day of survey. The most common reasons were that it would be hung later (23 percent), it is hung only at night (15 percent) and that not enough space was available to hang the net (14 percent). Among the reasons coded as other were excess net, net was still packed, claimed net to be invaded by bedbugs, user was not available, they feared to develop itchy skin and that it had been washed.

	Total		Rural		Urban		Malaria endemicity						Wealth index quintiles									
							Highland epidemic		Lake endemic		Coast endemic		Poorest		Second		Middle		Fourth		Richest	
	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent
Net too difficult to hang	10	.4	6	.3	4	.6	0	0.0	7	.6	2	.5	2	.3	2	.3		.1	2	.4	4	1.6
Net is too short	41	1.7	32	1.9	8	1.3	2	.2	33	2.8	6	1.2	11	1.9	16	2.5	6	1.5	3	.6	4	1.4
No space to hang net	340	14.3	269	15.5	71	11.1	118	16.8	162	13.7	60	12.1	119	19.8	114	17.8	36	8.6	43	9.6	29	10.3
No one to hang net	64	2.7	34	2.0	30	4.6	28	4.0	4	.4	32	6.4	4	.6	3	.5	30	7.2	18	4.1	9	3.3
Will hang it later	546	22.9	448	25.7	98	15.2	103	14.7	382	32.2	61	12.3	109	18.2	189	29.4	122	29.2	85	19.2	41	14.5
We only hang it at night	359	15.1	207	11.9	153	23.7	30	4.2	181	15.3	148	30.0	70	11.7	82	12.8	66	15.9	90	20.4	51	18.0
Other	992	41.6	721	41.5	271	42.1	400	57.0	411	34.6	181	36.5	277	46.0	224	34.9	152	36.5	196	44.5	142	50.5
Don't know	31	1.3	22	1.3	9	1.4	21	2.9	6	.5	5	.9	9	1.5	13	2.0	4	.9	5	1.0	1	.4
Total	2383	100.0	1738	100.0	644	100.0	702	100.0	1187	100.0	494	100.0	601	100.0	642	100.0	417	100.0	441	100.0	282	100.0

Table 5.10: Reasons why the net was not hanging for sleeping

5.5: Net preference

Household respondents were asked about their preferred colour and shape of nets, with the results shown in table 5.11 and figure 13. Majority of the respondents (66 percent) preferred blue colour while 14% preferred white and 14% preferred green colour. Only six percent of the respondents said they did not care about the colour of the net.

Across all epidemiological zones, majority of the respondents reported that they preferred blue nets with 67 percent in highland epidemic, 63 percent in lake endemic and 69 percent in coast endemic respectively. Moreover, rectangular nets were preferred by majority of the respondents across all the epidemiological zones with 52 percent, 49 percent and 61 percent in highland epidemic, lake endemic and coast endemic respectively.

Count		Rural		Urban		Malaria endemicity						Total	
					Highland epidemic		Lake endemic		Coast endemic				
		per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	
Preferred color of net	Green	442	15.5	149	10.7	210	12.8	288	17.1	93	10.3	590	14.0
	Blue	1935	68.1	834	60.2	1095	66.6	1053	62.5	622	68.8	2769	65.5
	White	277	9.7	312	22.5	211	12.9	251	14.9	127	14.1	589	13.9
	Don't care	189	6.7	91	6.6	127	7.7	92	5.5	61	6.8	280	6.6
	Total	2843	100	1386	100	1643	100	1683	100	904	100	4229	100
Preferred shape of net	Conical	1201	42.2	621	44.8	717	43.6	790	46.9	315	34.8	1822	43.1
	Rectangular	1525	53.6	704	50.8	852	51.9	823	48.9	553	61.2	2229	52.7
	Does not care	118	4.2	61	4.4	73	4.5	70	4.2	35	3.9	179	4.2
	Total	**2843**	**100**	**1386**	**100**	**1643**	**100**	**1683**	**100**	**904**	**100**	**4229**	**100**

Table 5.11: Net Preferences, PMLLIN 2018

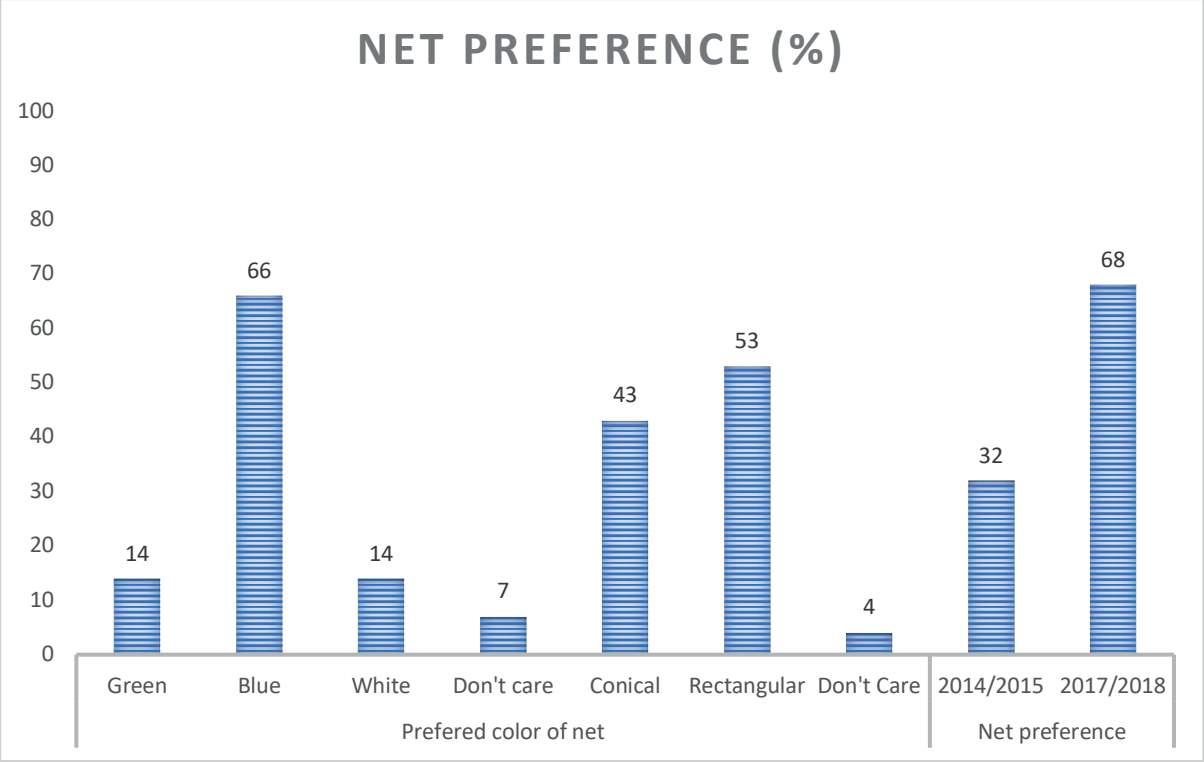


Figure 13: Net Preference, colour and shape

5.6: Comparison of 2014/15 and 2017/18 net and height preference

Count		Rural		Urban		Malaria endemicity						Total	
					Highland epidemic		Lake endemic		Coast endemic				
		per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	Count	per cent	
How does this net compare to the nets you received in 2014/15 mass net campaign	Longer	1017	35.8	396	28.6	628	38.2	584	34.7	200	22.2	1413	33.4
	Shorter	607	21.4	191	13.8	206	12.5	424	25.2	168	18.6	798	18.9
	Same	218	7.7	63	4.5	121	7.3	131	7.8	29	3.2	281	6.6
	Can't remember	242	8.5	128	9.2	182	11.1	97	5.7	91	10.1	370	8.7
	Didn't receive a net in 2014/15 campaign	759	26.7	608	43.9	506	30.8	446	26.5	415	46.0	1368	32.3
	Total	2843	100	1386	100	1643	100	1683	100	904	100	4229	100
Which net of the two (2014/2015 and 2017/2018) mass net campaigns do you prefer to use?	2014/2015	671	32.2	238	30.7	304	26.7	449	36.3	156	32.0	909	31.8
	2017/2018	1413	67.8	539	69.3	833	73.3	787	63.7	332	68.0	1952	68.2
	Total	**2084**	**100**	**777**	**100**	**1137**	**100**	**1236**	**100**	**488**	**100**	**2862**	**100**

Respondents were asked to compare the nets they had received during the 2017 /2018 mass campaign to the ones they had received in the 2014/ 2015 campaign and give their preference in terms of size. The results are shown in table 5.12. About a third (33 percent) reported that the 2017/2018 nets were longer, 19 percent said they were shorter than the 2014/2015. Seven percent reported that the nets had the same size. About nine percent could not remember while 32 percent reported that they had not received the 2014/2015 nets and therefore could not compare.

In addition to the comparison, respondents who had received nets in both campaigns were asked which campaign net(s) they preferred to use. Sixty-eight percent said they preferred using the 2017/2018 mass campaign nets. The factors around preference of net may be varied and size alone was not a major factor. In 2014/2015 different counties received different nets (colour, shape and texture) that were also varied in 2017/2018 and therefore it was difficult to compare the results. There is need to undertake a qualitative survey to determine in detail the preference of nets in the community. This is because a significant proportion (32%) had not received both nets and could not make a comparison.

6. CONLUSIONS AND RECOMMENDATIONS

6.1: Conclusion

The findings of the 2018 PMLLIN survey indicated that 83 percent of households surveyed own at least one long-lasting insecticidal net (LLIN) and that 51 percent of households had attained universal coverage (1 LLIN per every two people sleeping in the household). It was noted that ownership of LLINs increased with the average number of LLINs per household at 2.4 up from 1.8 in the previous campaign, of 2014/2015.

Three quarters of the household population surveyed had access to an LLIN. Moreover, 66 percent of the household members slept under an LLIN the night before the survey and 91 percent of members of households with at least one LLIN for every two people slept under an LLIN the night before the survey. About three quarters (73 percent) of children under five years slept under an LLIN the night before the survey. In households with at least an LLIN, the use by children under five years was 88 percent. Seventy-five percent of pregnant women slept under an LLIN the night before the survey, and 97 percent of pregnant women slept under an LLIN in households with one or more LLIN for every two people.

The best source of information on mass net campaign was through existing community structures (community leaders, interpersonal communication (IPC) during registration, barazas, health workers) and radio.

More than 98 percent of household respondents were confident that they could hang a net and felt that it was important and safe for young children to sleep under a net. About 56 percent of households said that they would never use a bed net for purposes other than for sleeping, and ninety- one percent agreed that they could hang a net anywhere people sleep in their house. For every 10 respondents interviewed, six of them either strongly agreed or somewhat agreed that people were at risk of getting malaria throughout the year.

Across all epidemiological zones, majority of respondents reported that they preferred blue nets that were rectangular in shape. Despite majority of households preferring the 2017/2018 nets, different counties received different nets in colour, shape and texture in the two campaigns and therefore it was difficult to compare the results. Results on preference on height were unclear.

Fourteen households had their nets still sealed/packed and not in use.

6.2: Recommendations

Alternative channels for provision of LLINs need to be explored in order to increase ownership and to ensure that 100 percent of households have at least one LLIN for every two people, and sustain it. These alternate channels might better target households with one person, as well as households with six or more members. There is also need to explore the use of existing community health structure data or registration data for previous mass net distribution to inform LLIN projection quantities for subsequent campaign in order to minimize nets getting finished before everyone registered received their nets and to minimize capping or limits to the number of nets to give to large households since it is noted that LLIN orders for a mass campaign are made many months before micro-planning are done, thus the need to find better estimations of net needs.

Another idea to explore is perhaps use existing community health structures, and pilot quantification studies to better define the parameters used in macro-quantification (e.g. is 1.8 really the right parameter in all areas?) and to explore the feasibility of quantifying net needs using door-to-door visits to look at sleeping spaces.

Though LLIN use has increased from the PMLLIN 2017 survey, there is need to sustain accurate, targeted communication to ensure the continued use of LLIN by all household members and especially the most vulnerable through various channels

There is need to continue investing in adequate and timely communication around registration and distribution to ensure everybody learns about mass net distribution.

Procurement of nets for all epidemiological zones should be blue and either conical or rectangular.

Future procurement of nets should be informed by net preference by colour, shape, size and texture. There is need to investigate further on the net preference aspects to enhance community acceptance and use of the nets issued for malaria prevention.

To enhance malaria prevention through use of nets, SBC communication at the community level should be strengthened with a multipronged approach to ensure advocacy for net hang up, consistent and proper use of nets, and proper net care.

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APPENDIX

APPENDIX A: SAMPLE DESIGN

Appendix 1 - Sample Design

A.1 Introduction

The 2018 Post Mass Long Lasting Insecticidal Treated Net survey (2018PMLLIN) was a cross-sectional population-based survey that utilized a two-stage stratified cluster sampling methodology. The survey used a representative probability sample to provide reliable estimates at each of the three epidemiological zones.

A.2 Sample Size and Allocation

In designing the sample, the proportion of pregnant women who slept under a Long-Lasting Insecticide Net was used to compute the required minimum sample size in each epidemiological zone. Further, power allocation method was used to distribute the households in each zone first to the counties and then to the rural and urban strata of each county based on the 2009 enumerated census figures. The final sample for the 2018 PMLLIN was 5,040 households from total of 168 clusters. This constituted 99 and 69 rural and urban clusters, respectively. The distribution of the sample is shown in table A1.

Endemicity Zone	County	SAMPLE CLUSTERS			SAMPLE HOUSEHOLDS		
		Rural	Urban	Total	Rural	Urban	Total
Coast Endemic	Kilifi	7	5	12	210	150	360
	Kwale	6	3	9	180	90	270
	Lamu	2	2	4	60	60	120
	Mombasa		10	10	-	300	300
	Taita Taveta	5	3	8	150	90	240
	Tana River	4	2	6	120	60	180
	Sub-Total	**24**	**25**	**49**	**720**	**750**	**1,470**
Lake Endemic	Bungoma	3	2	5	90	60	150
	Busia	2	3	5	60	90	150
	Kakamega	4	2	6	120	60	180
	Vihiga	5	3	8	150	90	240
	Homa Bay	4	2	6	120	60	180
	Kisumu	3	3	6	90	90	180
	Migori	3	2	5	90	60	150
	Siaya	4	2	6	120	60	180
	Sub-Total	**28**	**19**	**47**	**840**	**570**	**1,410**
Highland Epidemic	Kisii	6	3	9	180	90	270
	Nyamira	5	3	8	150	90	240
	Bomet	6	2	8	180	60	240
	Kericho	5	3	8	150	90	240
	Nandi	5	2	7	150	60	210
	Narok	6	2	8	180	60	240
	Trans-Nzoia	5	3	8	150	90	240
	West Pokot	4	2	6	120	60	180
	Uasin Gishu	5	5	10	150	150	300
	Sub-Total	**47**	**25**	**72**	**1,410**	**750**	**2,160**
Total		**99**	**69**	**168**	**2,970**	**2,070**	**5,040**

Table A1: Sample Allocation for 2018 PMLLIN

A.3 Sample Frame

Administratively, Kenya is divided into 47 counties. In turn, each county is subdivided into sub-counties. Prior to the enactment of the current constitution in 2010, the counties and sub-counties had not been created. Instead, the country was divided into provinces which were further divided into districts which are equivalent to the current sub-counties. Each district was divided into divisions, each division into locations and each location into sub-locations. In addition to these administrative units, each sub-location was subdivided into census enumeration areas (EAs) i.e. small geographic units with clearly defined boundaries. A total of 96,251 EAs were developed during the 2009 Census cartographic mapping. This information was used in 2010 to design a master sample known as the fifth National Sample Survey and Evaluation Programme (NASSEP V) with a total of 5,360 EAs. This is the frame that was used for the 2017 PMLLIN.

The NASSEP V master frame was designed in a multi-tied structure with four sub-samples (C1, C2, C3 and C4), each consisting of 1,340 EAs that can serve as independent frames. The frame used the counties as the first level stratification and further stratified by rural and urban areas, making a total of 92 strata with Nairobi City and Mombasa counties. The sampling of EAs into the frame was done independently within each stratum. Each sampled EA was developed into a cluster through listing and mapping process that standardized them into one measure of size having an average of 100 households (between 50 households and 149 households). The frame was gradually developed in phases from the year 2012 to 2015. The 2017 PMLLIN survey used C4 sub-sample.

A.4 Sampling of PSUs and Households

The survey sample was selected in two stages. Stage one involved selection of clusters, while the second stage involved selection of households. The selection of 168 clusters for the survey was done using the Equal Probability Selection Method (EPSEM). The clusters were selected systematically from NASSEP V frame independently within each stratum. The process involved ordering the clusters by county, then by urban/rural, and finally by geographic location. The resulting sample retained properties of PPS as used in creation of the frame.

Using the total number of households from each sampled cluster, a uniform sample of 30 households per cluster was selected using systematic sampling method. Systematic sampling is a probability sample selection method in which the sample is obtained by selecting every kth element of the population where k, the sampling interval, is an integer greater than 1 and is calculated as;

$$k = \frac{N}{n}$$

Where N is the total number of households in a cluster and n is the number of households to be selected in the cluster. The first number of the sample must be selected randomly from within the first k elements.

The sampled households were given to the teams in advance before they commenced data collection. The survey did not provide for substitution of sampled households and there was strictly no replacement of the preselected households.

A.5 Data Weighting

Because of the non-proportional sample allocation to the sampling strata, the survey was not self-weighting. Additionally, some of the sampled households refused to respond to the interviews while others could not be accessed due to various reasons. Accordingly, the sample required weighting adjustments to cater for non-proportional distribution of clusters and non-response, in order to provide estimates that are representative of target population.

The design weights incorporated the probabilities of selection of the clusters from the census EAs database into the NASSEP V sample frame, the probabilities of selection of the PLLIN clusters from NASSEP V frame and the probabilities of selection of the households from each of the Sampled PLLIN clusters. These design weights were then adjusted for household. Non-response was adjusted at stratum level.

We used the following mathematical relation;	
$W_{hi} = D_{hi} x \frac{C_h}{c_h} x \frac{S_{hi}}{l_{hi}}$	
where,	
W_{hi}=	Overall cluster weight for the i-th cluster in the h-th stratum
D_{hi}=	Sample cluster design weight obtained from cluster selection probabilities for the i-th cluster in the h-th stratum
C_h =	Number of clusters in h-th stratum
c_h=	Number of selected clusters in the h-th stratum
S_{hi} =	Number of listed households in the i-th cluster in the h-th stratum
l_{hi} =	Number of responding households in i-th cluster in the h-th stratum
Eventually, the weights were adjusted to ensure consistency with the projected population figures.	

KENYA POST MASS LLIN SURVEY, 2018
HOUSEHOLD QUESTIONNAIRE

NATIONAL MALARIA CONTROL PROGRAM
KENYA NATIONAL BUREAU OF STATISTICS

IDENTIFICATION

COUNTY _____

SUBLOCATION _____

NASSEP CLUSTER NUMBER . . . . . [ ][ ][ ][ ]

PMLLIN CLUSTER NUMBE . . . . . [ ][ ][ ]

CLUSTER NAME _____

STRUCTURE NUMBEF . . . . . [ ][ ][ ]

HOUSEHOLD NUMBEF . . . . . [ ][ ][ ]

_____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY [ ][ ]
				MONTH [ ][ ]
				YEAR [ ][ ][ ][ ]
INTERVIEWER'S NAME	_____	_____	_____	INT. NO. [ ][ ][ ]
RESULT*	_____	_____	_____	RESULT* [ ]
NEXT VISIT: DATE	_____	_____		TOTAL NUMBER OF VISITS [ ]
TIME	_____	_____		

*RESULT CODES:

1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3 ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4 POSTPONED
5 REFUSED
6 DWELLING VACANT OR ADDRESS NOT A DWELLING
7 DWELLING DESTROYED
8 DWELLING NOT FOUND
9 OTHER _____ (SPECIFY)

TOTAL PERSONS IN HOUSEHOLD [ ][ ]

TOTAL ELIGIBLE WOMEN [ ][ ]

TOTAL ELIGIBLE CHILDREN [ ][ ]

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE [ ][ ]

LANGUAGE OF QUESTIONNAIRE** [0][2]

LANGUAGE OF INTERVIEW** [ ][ ]

TRANSLATOR (YES = 1, NO = 2) [ ]

LANGUAGE OF QUESTIONNAIRE** KISWAHILI

**LANGUAGE CODES:
01 ENGLISH
02 KISWAHILI

SUPERVISOR: _____ NAME [ ][ ][ ] NUMBER

HH-1

HH-2

THIS PAGE IS INTENTIONALLY BLANK

HH-3

INTRODUCTION AND CONSENT

ADMINISTER CONSENT

RESPONDENT AGREES TO BE INTERVIEWED . . 1

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . 2 → END

100	RECORD THE TIME.	HOURS . . . . . MINUTES . . . . .

HH-5

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBILITY		
1	2	3	4	5	6	7	8	9	10
	Tafadhali nipe majina ya watu ambao kwa kawaida huishi hapa, au unaoishi nao kwa sasa ukianza na kiongonzi wa nyumba hii. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-9 FOR EACH PERSON.	Kuna uhusiano gani kati ya (NAME) na kiongozi wa nyumba hi? SEE CODES BELOW.	(NAME) ni mke ama ni mume?	(NAME) kwa kawaida anaishi hapa?	(NAME) alilala hapa jana usiku?	(NAME) ana umri gani? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49 YEARS	Je (NAME) ni mjamzito? (ALL WOMEN AGED 15-49 YEARS) (SKIP IF MALE)	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-4 YEARS
			M F	Y N	Y N	IN YEARS		Y N	
01			1 2	1 2	1 2		01	1 2	01
02			1 2	1 2	1 2		02	1 2	02
03			1 2	1 2	1 2		03	1 2	03
04			1 2	1 2	1 2		04	1 2	04
05			1 2	1 2	1 2		05	1 2	05
06			1 2	1 2	1 2		06	1 2	06
07			1 2	1 2	1 2		07	1 2	07
08			1 2	1 2	1 2		08	1 2	08
09			1 2	1 2	1 2		09	1 2	09
10			1 2	1 2	1 2		10	1 2	10

TICK HERE IF CONTINUATION SHEET USED ☐

2A) Ili nihakikishe kuwa nina orodha kamili, je, kuna watu wengine wowote kama vile watoto wadogo au wachanga ambao hawajaandikwa?	YES ☐ →	ADD TO TABLE	NO ☐
2B) Kuna watu wengine wowote ambao sio wa familia hii, kama vile wafanyikazi wa nyumbani, wakomboaji, ama marafiki ambao huishi hapa kwa kawaida?	YES ☐ →	ADD TO TABLE	NO ☐
2C) Je, kuna wageni au wageni ambao wamewatembelea kwa muda fupi ambao wanaishi hapa, ama mtu mwingine yeyote ambaye alilala hapa jana usiku ambao	YES ☐ →	ADD TO TABLE	NO ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/
11 = NOT RELATED
98 = DON'T KNOW

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBILITY		
1	2	3	4	5	6	7	8	9	10
	Tafadhali nipe majina ya watu ambao kwa kawaida huishi hapa, au unaoishi nao kwa sasa ukianza na kiongonzi wa nyumba hii. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-9 FOR EACH PERSON.	Kuna uhusiano gani kati ya (NAME) na kiongozi wa nyumba hi? SEE CODES BELOW.	(NAME) ni mke ama ni mume?	(NAME) kwa kawaida anaishi hapa?	(NAME) alilala hapa jana usiku?	(NAME) ana umri gani? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49 YEARS	Je (NAME) ni mjamzito? (ALL WOMEN AGED 15-49 YEARS) (SKIP IF MALE)	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-4 YEARS
11			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS	11	Y N 1 2	11
12			1 2	1 2	1 2		12	1 2	12
13			1 2	1 2	1 2		13	1 2	13
14			1 2	1 2	1 2		14	1 2	14
15			1 2	1 2	1 2		15	1 2	15
16			1 2	1 2	1 2		16	1 2	16
17			1 2	1 2	1 2		17	1 2	17
18			1 2	1 2	1 2		18	1 2	18
19			1 2	1 2	1 2		19	1 2	19
20			1 2	1 2	1 2		20	1 2	20

TICK HERE IF CONTINUATION SHEET USED ☐

2A)	Ili nihakikishe kuwa nina orodha kamili, je, kuna watu wengine wowote kama vile watoto wadogo au wachanga ambao hawajaandikwa?	YES	ADD TO TABLE NO
2B)	Kuna watu wengine wowote ambao sio wa familia hii, kama vile wafanyikazi wa nyumbani, wakomboaji, ama marafiki ambao huishi hapa kwa kawaida?	YES	ADD TO TABLE NO
2C)	Je, kuna wageni au wageni ambao wamewatembelea kwa muda fupi ambao wanaishi hapa, ama mtu mwingine yeyote ambaye alilala hapa jana usiku ambao	YES	ADD TO TABLE NO

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/
11 = NOT RELATED
98 = DON'T KNOW

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	Chanzo kikuu cha maji ya kunywa kwa watu wa nyumba yako/yenu ni gani? / Watu wa nyumba yako hutoa maji ya kunywa wapi?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 TUBE WELL OR BOREHOLE . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 BOTTLED WATER . . . . . 91 OTHER _____ 96 (SPECIFY)	→ 104 → 102 → 102
101A	Je,wenye nyumba hii hupata wapi maji wanaotumia kwa mahitaji mengine kama kupikia na kunawa mikono?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 TUBE WELL OR BOREHOLE . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 OTHER _____ 96 (SPECIFY)	→ 104
102	Chanzo hicho kiko pahali gani? / Hi maali ya kuchota maji iko wapi?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 104
103	Inachukua muda gani kwenda huko, kuchota maji na kurudi?	MINUTES . . . . . [ ][ ][ ] DON'T KNOW 998	
104	Kwa kawaida watu wa nyumba yako/yenu wanatumia choo cha aina gani? IF NOT POSSIBLE TO DETERMINE, ASK PERMISSION TO OBSERVE THE FACILITY.	**FLUSH OR POUR FLUSH TOILET** FLUSH TO PIPED SEWER SYSTEM . . . . . 11 FLUSH TO SEPTIC TANK . . . . . 12 FLUSH TO PIT LATRINE . . . . . 13 FLUSH TO SOMEWHERE ELSE . . . . . 14 FLUSH, DON'T KNOW WHERE . . . . . 15 **PIT LATRINE** VENTILATED IMPROVED PIT LATRINE . . . . . 21 PIT LATRINE WITH SLAB . . . . . 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT . . . . . 23 COMPOSTING TOILET . . . . . 31 BUCKET TOILET . . . . . 41 HANGING TOILET/HANGING LATRINE . . . . . 51 NO FACILITY/BUSH/FIELD . . . . . 61 OTHER _____ 96 (SPECIFY)	→ 107

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
105	Je mwatumia choo hiki pamoja na watu wa nyumba nyingine?	YES . . . . . 1 NO 2	 107
106	Ukijumulisha pamoja na nyumba/familia yako, ni familia ngapi zinazotumia choo hiki?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . [0][ ] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	
107	Ni vyumba (room) vingapi katika nyumba hii vinavyotumika kwa kulala?	ROOMS . . . . . [ ][ ]	
108	Nyumba hii inamiliki mfugo wowote, kundi la mifugo, wanyama wengine wa mifugo ama ndege mifugo (kama kuku au bata na ndege zingine)?	YES . . . . . 1 NO 2	 110
109	Nyumba hii inamiliki wanyama wangapi wafuatao: IF NONE, RECORD '00'. IF 95 OR MORE, RECORD '95'. IF UNKNOWN, RECORD '98'.		→
	a) Ng'ombe wa kienyeji?	a) LOCAL CATTLE . . . . . [ ][ ]	
	b) Ng'ombe wa gredi?	b) EXOTIC/GRADE CATTLE . . . . . [ ][ ]	
	c) Farasi, punda ama nyumbu?	c) HORSES/DONKEYS/MULES . . . . [ ][ ]	
	d) Mbuzi?	d) GOATS . . . . . [ ][ ]	
	e) Kondoo?	e) SHEEP . . . . . [ ][ ]	
	f) Kuku ama ndege mfugo zingine ?	f) CHICKENS/POULTRY . . . . . [ ][ ]	
110	Je kuna mtu yeyote wa nyumba hii anamiliki shamba la ukulima?	YES . . . . . 1 → NO 2	 112

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

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HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
			→
			→

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	Watu wa nyumba hii wana ekari ama hekta ngapi za shamba ya kulima? ACRES / HECTARES: IF 995 OR MORE, RECORD '995.0' IN APPROPRIATE BOX. PLOT SIZE (SQ FT): IF 999995 OR MORE, RECORD '999995.0' IN APPROPRIATE BOX.	ACRES . . . . . 1 ☐☐☐.☐ HECTARES . . . . 2 ☐☐☐.☐ PLOT SIZE (SQ FT) . . . . . 3 ☐☐☐☐☐.☐ DON'T KNOW 9999998	
112	Nyumba yako/yenu ina:	YES NO	→
	a) Umeme?	a) ELECTRICITY 1 2	
	b) Redio?	b) RADIO 1 2	
	c) Television?	c) TELEVISION 1 2	
	d) Simu isiyo ya mkono?	d) NON-MOBILE TELEPHONE . . 1 2	
	e) Tarakilishi ama computer?	e) COMPUTER 1 2	
	f) Friji?	f) REFRIGERATOR 1 2	→
	g) Solar panel?	g) SOLAR PANEL 1 2	
	h) Meza?	h) TABLE 1 2	
	i) Kiti?	i) CHAIR 1 2	
	j) Sofa?	j) SOFA 1 2	
	k) Kitanda?	k) BED 1 2	
	l) Kabati?	l) CUPBOARD 1 2	
	m) Saa ya ukuta?	m) CLOCK 1 2	
	n) Mikrowev?	n) MICROWAVE OVEN 1 2	
	o) Mashine ya DVD?	o) DVD PLAYER 1 2	
	p) Mashine ya CD?	p) CD PLAYER 1 2	
113	Kuna mtu yeyote wa nyumba hii anayemiliki:	YES NO	
	a) Saa ya mkono?	a) WATCH 1 2	
	b) Mobile phone / simu ya mkono?	b) MOBILE PHONE 1 2	→
	c) Baiskeli?	c) BICYCLE 1 2	
	d) Pikipiki ama skuta?	d) MOTORCYCLE/SCOOTER 1 2	
	e) Mkokoteni / rukwama la mnyama?	f) ANIMAL-DRAWN CART 1 2	
	f) Gari ndogo ama ya mizigo?	g) CAR/TRUCK 1 2	
	g) Boti ya machine?	h) BOAT WITH MOTOR 1 2	
113A	Kiongozi wa nyumba aliwahi kwenda shule?	YES . . . . . 1 NO 2	 114
113B	Ni kiwango gani cha juu zaidi cha elimu alichofika kiongozi wa nyumba: msingi, chuo cha ufundi, upili, ama zaidi?	PRIMARY . . . . . 1 POST-PRIMARY/VOCATIONAL . . . . . 2 SECONDARY/ 'A' LEVEL . . . . . 3 COLLEGE (MIDDLE LEVEL . . . . . 4 UNIVERSITY 5	
113C	Je, huyo kiongozi wa nyumba alimaliza kiwango hicho?	YES . . . . . 1 NO 2	
114	Kuna mtu yeyote wa nyumba hii anayemiliki akaunti ya banki?	YES . . . . . 1 NO 2	
117	Nyumba yenu ina neti yoyote ya mbu?	YES . . . . . 1 NO 2	 128A
118	Nyumba yenu ina neti za mbu ngapi? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . ☐	

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
			→
			→

MOSQUITO NET ROSTER

		NET #1	NET #2	NET #3
119	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD. IF MORE THAN 3 NETS, USE ADDITIONAL	OBSERVED . . . . 1 NOT OBSERVED 2	OBSERVED . . . . 1 NOT OBSERVED 2	OBSERVED . . . . 1 NOT OBSERVED 2
120	Ni miezi mingapi iliyopita nyumba yenu ilipopata neti hi ya mbu? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . . 95 NOT SURE 98	MONTHS AGO . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . . 95 NOT SURE 98	MONTHS AGO . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . . 95 NOT SURE 98
121	OBSERVE OR ASK BRAND/TYPE OF MOSQUITO NET. IF BRAND IS UNKNOWN AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** OLYSET (SUPA-NET EXTRA) . . . . 11 PERMANET (SUPA-NET EXTRA) . . . . 12 NETPROTECT . . . . 13 YORKOOL . . . . 14 OTHER/DON'T KNOW BRAND . . . . 16 UNBRANDED . . . . 71 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** OLYSET (SUPA-NET EXTRA) . . . . 11 PERMANET (SUPA-NET EXTRA) . . . . 12 NETPROTECT . . . . 13 YORKOOL . . . . 14 OTHER/DON'T KNOW BRAND . . . . 16 UNBRANDED . . . . 71 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** OLYSET (SUPA-NET EXTRA) . . . . 11 PERMANET (SUPA-NET EXTRA) . . . . 12 NETPROTECT . . . . 13 YORKOOL . . . . 14 OTHER/DON'T KNOW BRAND . . . . 16 UNBRANDED . . . . 71 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98
121A	OBSERVE FOR OR ASK IF HOLES IN NET. RECORD THE SIZE OF THE LARGEST HOLE.	HOLE SMALLER THAN A THUMB/FINGER . . 1 HOLE LARGER THAN THUMB BUT SMALLER THAN FIST/HAND . . . 2 HOLE LARGER THAN FIST BUT SMALLER THAN HEAD . . . . 3 HOLE LARGER THAN HEAD . . . . 4 NO HOLES 5	HOLE SMALLER THAN A THUMB/FINGER . . 1 HOLE LARGER THAN THUMB BUT SMALLER THAN FIST/HAND . . . 2 HOLE LARGER THAN FIST BUT SMALLER THAN HEAD . . . . 3 HOLE LARGER THAN HEAD . . . . 4 NO HOLES 5	HOLE SMALLER THAN A THUMB/FINGER . . 1 HOLE LARGER THAN THUMB BUT SMALLER THAN FIST/HAND . . . 2 HOLE LARGER THAN FIST BUT SMALLER THAN HEAD . . . . 3 HOLE LARGER THAN HEAD . . . . 4 NO HOLES 5
125	Neti mliipata wapi?	2017-18 CAMPAIGN . . . . 01 OTHER CAMPAIGN . . . . 02 ANC / CWC . . . . 03 DUKA/RURAL SHOP . . 04 SUPERMARKET/ RETAIL SHOP . . . . 05 FRIEND/RELATIVE . . . . 06 OTHER . . . . 96 DON'T KNOW 98	2017-18 CAMPAIGN . . . . 01 OTHER CAMPAIGN . . . . 02 ANC / CWC . . . . 03 DUKA/RURAL SHOP . . 04 SUPERMARKET/ RETAIL SHOP . . . . 05 FRIEND/RELATIVE . . . . 06 OTHER . . . . 96 DON'T KNOW 98	2017-18 CAMPAIGN . . . . 01 OTHER CAMPAIGN . . . . 02 ANC / CWC . . . . 03 DUKA/RURAL SHOP . . 04 SUPERMARKET/ RETAIL SHOP . . . . 05 FRIEND/RELATIVE . . . . 06 OTHER . . . . 96 DON'T KNOW 98
125A	Mlilipa pesa ngapi kwa neti?	COST . . . . [ ][ ][ ][ ] FREE . . . . 9995 NOT SURE 9998	COST . . . . [ ][ ][ ][ ] FREE . . . . 9995 NOT SURE 9998	COST . . . . [ ][ ][ ][ ] FREE . . . . 9995 NOT SURE 9998
126	Kuna mtu yeyote aliyelala ndani ya hii neti ya mbu jana usiku?	YES . . . . 1 NO . . . . 2 (SKIP TO 127A) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 127A) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 127A) NOT SURE 8

HH-16

MOSQUITO NET ROSTER

		NET #1	NET #2	NET #3
		(SKIP TO 127B) ←	(SKIP TO 127B) ←	(SKIP TO 127B) ←

MOSQUITO NET ROSTER

		NET #1	NET #2	NET #3	
127	Je ni nani aliyelala ndani ya hii neti ya mbu jana usiku? RECORD THE PERSON'S NAME AND LINE NUMBER FROM HOUSEHOLD SCHEDULE.	NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ]	NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ]	NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ] NAME ______ LINE NO. . . . . [ ][ ]	
127A	Ni sababu gani la muhimu kwamba hakuna mtu alilala ndani ya neti hii jana usiku? RECORD ONE ANSWER	NO MOSQUITOES . . . . 1 NO MALARIA . . . . 2 TOO HOT . . . . 3 DON'T LIKE SMELL . . . . 4 FEEL CLOSED IN . . . . . 5 NET TOO OLD OR TORN . 6 NET TOO DIRTY . . . 7 NET NOT AVAILABLE LAST NIGHT (WASHING) . . . 8 USUAL USER DID NOT SLEEP HERE LAST NIGHT . . . 9 NET WAS NOT NEEDED LAST NIGHT . . . . 10 NO PLACE TO HANG IT . . 11 EXCESS NET . . . . . 12 NET STILL IN PACK. . . . . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	NO MOSQUITOES . . . . 1 NO MALARIA . . . . 2 TOO HOT . . . . 3 DON'T LIKE SMELL . . . . 4 FEEL CLOSED IN . . . . . 5 NET TOO OLD OR TORN . 6 NET TOO DIRTY . . . 7 NET NOT AVAILABLE LAST NIGHT (WASHING) . . . 8 USUAL USER DID NOT SLEEP HERE LAST NIGHT . . . 9 NET WAS NOT NEEDED LAST NIGHT . . . . 10 NO PLACE TO HANG IT . . 11 EXCESS NET . . . . . 12 NET STILL IN PACK. . . . . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	NO MOSQUITOES . . . . 1 NO MALARIA . . . . 2 TOO HOT . . . . 3 DON'T LIKE SMELL . . . . 4 FEEL CLOSED IN . . . . . 5 NET TOO OLD OR TORN . 6 NET TOO DIRTY . . . 7 NET NOT AVAILABLE LAST NIGHT (WASHING) . . . 8 USUAL USER DID NOT SLEEP HERE LAST NIGHT . . . 9 NET WAS NOT NEEDED LAST NIGHT . . . . 10 NO PLACE TO HANG IT . . 11 EXCESS NET . . . . . 12 NET STILL IN PACK. . . . . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	
127B	Net hii imewahi kuoshwa?	YES . . . . 1 NO . . . . 2 DON'T 98	YES . . . . 1 NO . . . . 2 DON'T 98	YES . . . . 1 NO . . . . 2 DON'T 98	127F
127C	Ni mara gapi neti hii imeoshwa kwa miezi sita iliyopita?	Number of times [ ][ ]	Number of times [ ][ ]	Number of times [ ][ ]	
127D	Mara ya mwisho kuosha neti, ni nini iliongezewa kwa maji?	BAR SOAP . . . . 1 DETERGENT . . . . 2 BLEACH . . . . 3 MIX . . . . 4 NOTHING . . . . 5 DON'T KNOW 98	BAR SOAP . . . . 1 DETERGENT . . . . 2 BLEACH . . . . 3 MIX . . . . 4 NOTHING . . . . 5 DON'T KNOW 98	BAR SOAP . . . . 1 DETERGENT . . . . 2 BLEACH . . . . 3 MIX . . . . 4 NOTHING . . . . 5 DON'T KNOW 98	
127E	Neti ilianikwa wapi?	OUTSIDE ON THE GROUND 1 OUTSIDE ON LINE 2 OUTSIDE ON BUSH/FENCE 3 OTHER ______ 96 (SPECIFY)	OUTSIDE ON THE GROUND 1 OUTSIDE ON LINE 2 OUTSIDE ON BUSH/FENCE 3 OTHER ______ 96 (SPECIFY)	OUTSIDE ON THE GROUND 1 OUTSIDE ON LINE 2 OUTSIDE ON BUSH/FENCE 3 OTHER ______ 96 (SPECIFY)	
127F	OBSERVE FOR OR ASK IF THE NET IS HANGING FOR SLEEPING.	HANGING . . . . 1 (SKIP TO 128A) NOT HANGING 2	HANGING . . . . 1 (SKIP TO 128A) NOT HANGING 2	HANGING . . . . 1 (SKIP TO 128A) NOT HANGING 2	
127G	Neti haikutundikwa kwa kulaliwa. Haikutundikwa kwa sababu:	NET TOO DIFFICULTY TO HANG UP . . . . A NET TOO SHORT . . . . . B NO SPACE TO HANG NET C NO ONE TO HANG NET . . . D WILL HANG IT LATER . . . E WE ONLY HANG IT AT NIGHT . . . . F OTHER ______ X (SPECIFY) DON'T KNOW . . Z	NET TOO DIFFICULTY TO HANG UP . . . . A NET TOO SHORT . . . . . B NO SPACE TO HANG NET C NO ONE TO HANG NET . . . D WILL HANG IT LATER . . . E WE ONLY HANG IT AT NIGHT . . . . F OTHER ______ X (SPECIFY) DON'T KNOW . . Z	NET TOO DIFFICULTY TO HANG UP . . . . A NET TOO SHORT . . . . . B NO SPACE TO HANG NET C NO ONE TO HANG NET . . . D WILL HANG IT LATER . . . E WE ONLY HANG IT AT NIGHT . . . . F OTHER ______ X (SPECIFY) DON'T KNOW . . Z	
127H		GO BACK TO 119 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 128A.	GO BACK TO 119 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 128A.	GO TO 119 IN FIRST COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 128A.	

HH-18

SOURCE AND USES OF MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
128A	Katika miezi 12 iliyopita, kuna mtu yeyote wa nyumba yenu aliwahi peana neti ya mbu?	YES . . . . . 1 NO 2	
128B	Katika miezi 12 iliyopita, kuna mtu yeyote wa nyumba yenu aliwahi uza neti ya mbu?	YES . . . . . 1 NO 2	
128C	Mara ya mwisho ulikuwa na neti ambayo haikuwa muhimu kwa kulala chini, ulifanyia nini? RECORD ALL RESPONSES. PROBE ONCE: Anything else?	REUSED FOR OTHER PURPOSI . . . . . A BURNED IT . . . . . B GARBAGE OR REFUSE DUMP . . . . . C DON'T KNOW . . . . . Z NOT APPLICABLE/DIDN'T HAVE XX	128F
128D	Neti ama nyuzi za kuunganisha ilitumika/zilitumika kwa kufanya nini?	FISHING . . . . . A DRYING FISH . . . . . B COVERING/PROTECTING SEEDLINGS/CROP . . C CURTAINS/SCREENS/ FOR WINDOWS/DOORS/ EAVES/CEILIN . . . . . D CLOTHING . . . . . E BEDDING/PADDING . . . . . F PATCH FOR OTHER NETS . . . . . G FENCING . . . . . H ROPE/TYING THINGS . . . . . I OTHER _____ X (specify)(specify)(specify) DON'T KNOW . . . . . Z	
128E	Ni sababu gani kuu uliyotumia neti kwa madhumuni mengine?	TOO MANY HOLES . . . . . A TOO DIRTY . . . . . B WORN OUT . . . . . C NO ONE USING IT ANY MORE . . . . . D NEEDED IT MORE FOR OTHER USES THAN SLEEPING . . . . . E OTHER _____ X (SPECIFY)	
128F **(1)**	Ulisikia kuhusu kampeni ya kugawa neti kwa wingi ya mwaka wa 2017-18?	YES . . . . . 1 NO . . . . . 2 →	128I
128G **(1)**	Ni kutoka wapi uliposikia kuhusu kampeni ya kugawa neti kwa wingi ya 2017-18? RECORD ALL MENTIONED.	POSTERS . . . . . A RADIO . . . . . B ROADSHOW . . . . . C PUBLIC ADDRESS SYSTEM . . . . . D CHIEF'S BARAZAS . . . . . E HEALTH WORKERS . . . . . F HOME VISIT DURING REGISTRATI . . . . . G COMMUNITY LEADERS . . . . . H FAMILY/FRIENDS . . . . . I OTHER _____ X (SPECIFY)	
128H **(1)**	Ujumbe uliosikia ama ulioona ulikuwa na maelezo gani? RECORD ALL MENTIONED.	GO GET REGISTERED(Jiandikishe) . . . . . A GO COLLECT YOUR NET(Pata neti) . . . . . B SLEEP UNDER YOUR NET EVERY NIGHT . . . . C KEEP YOUR NET FAR FROM FIRE . . . . . D KEEP YOUR NET CLEAN BUT WHEN NET IS DIRTY WASH WITH WATER AND NORMAL SOAI . . E AFTER WASHING YOUR NET DO NOT HANG IN DIRECT SUNLIGHT(HANG IN SHADE) . . . . . F HANG NET UNDER SHADE FOR 24 HOURS BEFORE USING FOR THE FIRST TIME . . . . . G OTHER _____ X (SPECIFY)	
128I **(1)**	Katika jumuiya yako kulikuwa na maonyesho ya jinsi ya kutundika neti ya mbu katika mwaka mmoja uliopita?	YES . . . . . 1 NO . . . . . 2 →	128K
128J **(1)**	Je, ulihudhuria hayo maonyesho ya kutundika neti ya mbu?	YES . . . . . 1 NO 2	
128K **(1)**	Je! Umesikia mawasiliano yoyote juu ya matumizi ya neti ya mbu au kuzuia malaria katika mwaka mmoja uliopita?	YES . . . . . 1 NO . . . . . 2 →	128N
128L **(1)**	Je, ulisikia jumbe hizo kuhusu matumizi ya neti na /au kuzuia malaria kwenye redio?	YES . . . . . 1 NO . . . . . 2 →	128N
128M **(1)**	Je, kati ya hizo jumbe ulizosikia kwenye redio kuna yoyote iliyokuwa na sehemu ya maneno "lala ndani ya neti kila siku kila msimu"?	YES . . . . . 1 NO 2	
128N **(1)**	Je! Uliona ujumbe kuhusu matumizi ya net au kuzuia malaria katika jumuiya yako?	YES . . . . . 1 NO 2	

SOURCE AND USES OF MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

SOURCE AND USES OF MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
128O **(1)**	Nyumba yako/yenu iliandikishwa kupokea neti katika kampeni ya hivi karibuni?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	128Q 128Q
128P **(1)**	Kwa nini nyumba yako/yenu haikuandikishwa?	ABSENT . . . . . 1 REFUSED . . . . . 2 NOT VISTED BY REGISTRAR . . . . . 3 DID NOT KNOW ABOUT REGISTRATION . . . . . 4 OTHER _____ 6 (Specify)(Specify)(Specify)	
128Q **(1)**	Kuna mtu kutoka kwa nyumba yako/yenu alikwenda pahali pa kugawa neti za kampeni ya 2017-17 kuchukua neti?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	128S 128S
128R **(1)**	Ni sababu gani mtu wa nyumba yako/yenu hakwenda pahali pa kugawa neti za kampeni ya 2017-18?	NO TIME / MEANS . . . . . 1 NOT INTERESTED . . . . . 2 FORGOT OR MISSED THE DATE . . . . . 3 OTHER _____ 6 (SPECIFY)	128Z
128S **(1)**	Mtu wa nyumba yako/yenu alipokea vocha zinazoonekana kama hii pahali pa kugawa neti za kampeni ya 2017-18? SHOW PICTURE OF VOUCHER TO RESPONDENT.	YES . . . . . 1 NO 2	
128T **(1)**	Mtu wa nyumba yako/yenu alipokea neti za mbu pahali pa kugawa neti za kampeni ya 2017-18?	YES . . . . . 1 NO 2	128Y
128U **(1)**	Je, Nyumba yako/yenu ilipokea neti za mbu ngapi pahali pa kugawa neti za kampeni ya 2017-18?	NUMBER OF NETS RECEIVED	
128V **(1)**	Ulionesha kuwa nyumba yako/yenu ilipokea neti za umbu [NUMBER FROM 128U] pahali pa kugawa neti za kampeni ya 2017-18. Kati ya hizi, ni ngapi bado ziko mikononi mwa nyumba yako/yenu?	NUMBER OF NETS REMAINING	
128W **(1)**	COMPARE 128U AND 128V AND MARK: NUMBERS ARE DIFFERENT NUMBERS ARE SAME		128Z
128X **(1)**	NI nini kilifanyika kwa neti zenye hauna? RECORD ALL MENTIONED.	NET WAS STOLEN . . . . . A NET WAS DESTROYED ACCIDENTALLY . . . . . B NET WAS SOLD . . . . . C NET WAS GIVEN AWAY . . . . . D OTHER X	128Z
128Y **(1)**	Kwa nini hukupata neti ya mbu yoyote pahali pa kugawa neti za kampeni ya 2017-18?	NO NETS AVAILABLE AT THIS TIME . . . . . 1 WAITING TIME TOO LONG . . . . . 2 THEY REFUSED TO GIVE NETS . . . . . 3 OTHER . . . . . 6 DON'T KNOW 8	
128Z	Ungependelea rangi gani ya neti: samawati, nyeupe ama kijani?	GREEN . . . . . 1 BLUE . . . . . 2 WHITE . . . . . 3 DOES NOT CARE 4	
129A	Muundo gani wa neti ungependelea: umbo la mviringo juu ama pembe nne?	CONICAL . . . . . 1 RECTANGULAR . . . . . 2 DOES NOT CARE 3	
129B	Je, hizi neti unalinganisha aje na zile neti ulizopata katika kampeni ya mwaka wa 2014-15?	LONGER . . . . . 1 SHORTER . . . . . 2 SAME . . . . . 3 CAN'T REMEMBER 4	
129C	Je! Unapendelea kuwa na neti gani katika hizi kampeni mbili, 2014/15 ama 2017/18?	2014 / 2015 . . . . . 1 2017 / 2018 2	
129D	Kwa nini unapendelea neti hii?	Specify _____	

SOURCE AND USES OF MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
129E	Sasa nataka kukuuliza maoni yako kuhusu mambo fulani. Nitasoma maneno fulani na nitakuomba uniambie kiwango cha maoni yako. Unajiamini kiasi gani kuwa unaweza kuanika neti ya mbu katika nyumba yako/yenu: unajiamini kabisa, unajiamini sana, unajiamini kidogo, ama hujiamini?	EXTREMELY CONFIDENT . . . . . 1 VERY CONFIDENT . . . . . 2 A LITTLE CONFIDENT . . . . . 3 NOT AT ALL CONFIDENT 4	
129F	Unafikiri ni muhimu kiasi gani kwa watoto wadogo kulala ndani ya neti iliyotiwa dawa: ni muhimu kabisa, ni muhimu sana, ni muhimi kidogo, ama si muhimu?	EXTREMELY IMPORTANT . . . . . 1 VERY IMPORTANT . . . . . 2 A LITTLE IMPORTANT . . . . . 3 NOT AT ALL IMPORTANT 4	
129G	Ni kila baada ya wakati gani unatumia neti za mbu kwa mambo mengine badala ya kulalia: wakati wote, mara kwa mara, mara moja moja, hujatumia kamwe?	ALL THE TIME . . . . . 1 SOMETIMES . . . . . 2 RARELY . . . . . 3 NEVER 4	
129H	Sasa nataka kukuuliza maoni yako kuhusu mambo fulani. Nitasoma maneno fulani na nitakuomba uniambie kama unakubaliana nayo kabisa, unakubaliana kiasi, hukubaliani nayo kiasi fulani ama hukubaliani kabisa. Neti zinazo tiiwa dawa hazina madhara kulalia ndani. Je, unakubaliana nayo kabisa, unakubaliana kiasi, hukubaliani nayo kiasi fulani, hukubaliani kabisa?	STRONGLY AGREE . . . . . 1 SOMEWHAT AGREE . . . . . 2 SOMEWHAT DISAGRE . . . . . 3 STRONGLY DISAGREE 4	
129I	Watu wengi katika jamii hii wanalala ndani ya neti iliyotiwa dawa kila usiku kila msimu. Je, unakubaliana kabisa, unakubaliana kiasi, hukubaliani kiasi fulani, hukubaliani kabisa?	STRONGLY AGREE . . . . . 1 SOMEWHAT AGREE . . . . . 2 SOMEWHAT DISAGRE . . . . . 3 STRONGLY DISAGREE 4	
129J	Unaweza kuanika neti pahali popote watu wanapolala katika nyumba yako/yenu. Je, unakubaliana kabisa, unakubaliana kiasi, hukubaliani kiasi fulani, hukubaliani kabisa?	STRONGLY AGREE . . . . . 1 SOMEWHAT AGREE . . . . . 2 SOMEWHAT DISAGRE . . . . . 3 STRONGLY DISAGREE 4	
129K	Watu wako katika hali ya uwezekano wa kupata malaria wakati wa mvua tu. Je, unakubaliana kabisa, unakubaliana kiasi, hukubaliani kiasi fulani, hukubaliani kabisa?	STRONGLY AGREE . . . . . 1 SOMEWHAT AGREE . . . . . 2 SOMEWHAT DISAGRE . . . . . 3 STRONGLY DISAGREE 4	

ADDITIONAL HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
129	OBSERVE MAIN MATERIAL OF THE FLOOR OF THE DWELLING. RECORD OBSERVATION.	**NATURAL FLOOR** EARTH/SAND . . . . . 11 DUNG . . . . . 12 **RUDIMENTARY FLOOR** WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 **FINISHED FLOOR** PARQUET OR POLISHED WOOD . . . . . 31 PVC/VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
130	OBSERVE MAIN MATERIAL OF THE ROOF OF THE DWELLING. RECORD OBSERVATION.	**NATURAL ROOFING** NO ROOF . . . . . 11 THATCH/GRASS/MAKUTI . . . . . 12 DUNG/MUD/SOI . . . . . 13 **RUDIMENTARY ROOFING** IRON SHEETS . . . . . 21 TIN CANS . . . . . 22 **FINISHED ROOFING** ASBESTOS SHEET . . . . . 31 CONCRETE . . . . . 32 TILES . . . . . 33 OTHER _____ 96 (SPECIFY)	
131	OBSERVE MAIN MATERIAL OF THE EXTERIOR WALLS OF THE DWELLING. RECORD OBSERVATION.	**NATURAL WALLS** NO WALLS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 DUNG/MUD/SOD 13 **RUDIMENTARY WALLS** BAMBOO WITH MUD . . . . . 21 STONE WITH MUD . . . . . 22 UNCOVERED ADOBE . . . . . 23 PLYWOOD . . . . . 24 CARDBOARD . . . . . 25 REUSED WOOD . . . . . 26 IRON SHEETS . . . . . 27 **FINISHED WALLS** CEMENT . . . . . 31 STONE WITH LIME/CEMENT . . . . . 32 BRICKS . . . . . 33 CEMENT BLOCKS . . . . . 34 COVERED ADOBE . . . . . 35 WOOD PLANKS/SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	
132	RECORD THE TIME.	HOURS . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

HH-24

APPENDIX C: CONSENT FORMS

Consent Form (English)

Introduction

Good morning/afternoon/evening …….... Our names are …… and ……., and we are doing a survey for the National Malaria Control Program. The National Malaria Control Program is part of the Ministry of Health. We are trying to find out about bed net use in Kenya. With your permission, we would like to interview the household head.

What is the purpose of this survey?

We are holding interviews at 5040 homesteads such as yours across twenty three Counties in Kenya to better understand the following:

1. How many homesteads currently have bed nets?
2. What type of bed nets people own and where they got the nets from?
3. Whether people have heard about nets?
4. Whether they had received a net in the recent LLIN distribution campaigns?
5. How they had learned about the campaign?

This information will help the Government decide on how to improve the distribution and use of nets in Kenya.

What we are asking from you.

We are asking you on behalf of your homestead to help us understand more about net use in Kenya by answering our questions. Our interviews will last about 30 minutes. We will ask questions about the homestead, net use by family members, and how people learnt about mass net distribution campaign. In particular we are interested in those you who received nets in the just ended mass net distribution campaign. We would like to look at the bed nets that you have in the house.

What are the risks and benefits of taking part?

There are no direct benefits to your homestead by agreeing to participate in our interviews. What we learn from this survey will help us design better programs in the future. This may help you or someone you know. We do not know of any risks from being in this survey.

How we will protect your family's privacy

Your answers will be recorded electronically on a form that does not have your name recorded on it. The paper consent form that you will sign cannot be linked to your answers in the interview. Nobody outside the survey team will have access to your individual information. All information that you or anyone else gives us will remain confidential as allowed by law. We will not give anybody's names to anybody else, as the law allows.

What happens if I don't want to participate?

You are free to choose to be in this survey or not. The local administration will not be informed of your choice either way. There is no penalty for saying no. If you decide to take part, you may stop at any time.

Please feel free to ask any questions about what we have just said. If you agree to participate, we will ask you to sign this paper below to show that the survey has been explained to you and that you agree to be part of the survey.

If you wish to have further information or if you have questions you wish to ask after the interview please contact:

1. The head,

National Malaria Control Program

P.O. BOX 19982 - 00202, Nairobi.

Attention to Dr. Rebecca Kiptui or Attention to: Abdikadir Awes

Mobile number: 0720 759 731 Mobile number: 0780 836 503

2. The Chairman

KNH/UON – ERC

P. O. Box 20723 – 00202, Nairobi

Telephone: 726300-9

Email: uonknh_erc@uonbi.ac.ke

Consent statement

This survey has been explained to me, and all of my questions have been answered. I have been told that being in this survey is my choice. I have been told that I am free to refuse and that I may stop the survey at any time. I agree to be in this survey.

Sign……..……..

Name (Print)……..…….Date……

(Client)

If unable to sign Mark: _____

NAME AND SIGNATURE OF OFFICER ADMINSTERING CONSENT

Signature: _____ Date: _____

Name of Research Assistant: _____

Consent Form (Kiswahili)

Dibaji

Habari za asubuhi / mchana / jioni……..... Majina yetu ni……na……na tunafanya utafiti katika Kitengo cha Kuthibiti Malaria. Kitengo cha Kuthibiti Malaria ni sehemu ya Wizara ya Afya. Tunajaribu kutafuta utumiaji wa neti / nyavu za kuzuia mbu nchini Kenya. Kwa ihari yako, tungependa kumhoji mkuu wa nyumba.

Lengo la huu utafiti ni nini?

Tunafanya mahojiano katika miji elfu tano na arobaini katika kaunti ishirini na tatu nchini Kenya mji wako ukiwemo ili kuelewa yafuatayo:

1. Miji mingapi yatumia neti / nyavu za kuzuia mbu?
2. Ni aina gani ya neti / nyavu za kuzuia mbu zinazotumiwa na walizipata wapi?
3. Kama watu walipata habari za neti /nyavu?
4. Kama walipokea neti hivi karibuni kupitia mradi wa usambazaji wa LLIN kampeni.
5. Jinsi walivyopata habari za kampeni.

Hizi habari zitasaidia serikali kuamua jinsi ya kuboresha usambazaji na matumizi ya neti za kuzuia mbu nchini Kenya.

Tunachohitaji kutoka kwako

Tunakuuliza kwa niaba ya mji wako kutuwezesha kuelewa mengi kuhusu utumiaji wa neti/nyavu za kuzuia mbu nchini Kenya kwa kuyajibu maswali yetu. Mahojiano yetu yatachukua mda wa dakika kama thelathini hivi. Tutakuuliza maswali kuhusu mji wako, utumiaji wa nyavu za kuzuia mbu miongoni mwa jamii yako na jinsi mlivyopata habari za LLIN kampeni. Tungependelea haswa, kuwahoji watu wote waliopokea neti/nyavu kutokana na kampeni ya LLIN. Tungependelea kuona neti/nyavu mzitumiazo nyumbani mwenu.

Hatari na faida ya kushiriki ni nini?

Hamna faida ya moja kwa moja kwa mji wako kwa kukubali kushiriki katika mahojiano yetu. Huu utafiti utatuwezesha kupanga mikakati maalum siku zijazo. Mikakati hii inaweza kukusaidia wewe ama mtu yeyote unayemjua. Hatujui hatari zozote zinazoambatana kutokana na kushiriki kwenu katika huu utafiti.

Jinsi tutakavyotunza faragha ya jamii yako

Majibu yako yatahifadhiwa katika mashini ya kompyuta katika hali isiokuwa na majina yako. Karatasi maalum ya idhini yako ambayo utatia sahihi, haiwezi kamwe kuambatanishwa na majibu yako katika haya mahojiano. Hamna yeyote nje ya huu utafiti awezaye kufikia au kupenyeza habari zako za kibinafsi. Habari zote zako au za mtu yeyote Yule zitawekwa vizuri na hatutapeana majina ya mtu yeyote kwa yeyote kulingana na kadri wa sheria iliopo.

Ni nini kitakachotendeka kama sitashiriki?

Uko huru kuamua kushiriki au kutoshiriki katika huu utafiti. Utawala wa kijiji hautaelezewa kuhusuu amuzi wako. Hamna adhabu yoyote kwa kutoshiriki. Endapo utaamua kushiriki basi uko huru kusimamisha kushiriki kwako wakati wowote utakavyo.

Tafadhali jihisi huru kuuliza swali lolote kuhusu tuliyoyasema humu. Basi ikiwa utakubali kushiriki, tutakuuliza kutia sahihi katika hii karatasi ifwatao huku chini, kubainisha kuwa utafiti umeelezewa na kufafanuliwa vilivyo na kwamba unakubali kushiriki katika huu utafiti.

Endapo utahitaji habari zaidi au utakuwa na maswali ungependelea kuuliza baada ya mahojiano tafadhali wasiliana na:

1. Mkuu wa Kitengo cha Kuthibiti Malaria,

Sanduku la Posta 19982-00202, Nairobi.

Makini: Daktari Rebecca Kiptui. Au Makini: Abdikadir Awes

Nambari ya simu: 0720 759 731 Nambari ya simu: 0780 836 503

2. Mwenye Kiti,

KNH/UON – ERC

Sanduku la Posta 20723 – 00202

Nairobi

Nambari ya simu: 726300-9

Baruapepe: uonknh_erc@uonbi.ac.ke

Kidadisi cha Kiapo

Nimeelezewa na kufafanuliwa vilivyo kuhusu utafiti huu na kujibiwa maswali yangu yote. Pia nimeelezewa kuwa kushiriki kwangu ni kwa kupenda na kuwa niko huru kusimamisha kushiriki kwangu wakati wowote nitakavyo. Ninakubali kushiriki katika utafiti huu.

Sahihi……..……..

Jina (andika)……..…….Date……

Kidadisi / Hojaji

Kiashirio cha Kagua la Malaria

Anayehoji (data collector)

Sahihi……..……..

Jina (andika)……..…….Date……

APPENDIX D: MEMBERSHIP OF THE PMLLIN STEERING COMMITTEE

1. Ministry of health
2. Kenya National Bureau of Statistics
3. WHO
4. USAID/PMI
5. Measure Evaluation- PIMA
6. Population Services Kenya
7. World Vision
8. JHU-CCP Vector works
9. Moi University

Terms of reference of the steering committee

1. To oversee the planning and implementation of the survey
2. To oversee the two PMLLIN subcommittees

PMLLIN Sub-committees

1. Technical subcommittee

Terms of references

The mandate of this subcommittee was to undertake all technical aspects of the survey namely:

i. To develop survey protocol,
ii. To determine the clusters sampling
iii. To oversee data management
iv. To review the questionnaire protocol
v. To develop database and data programme for the tools to be used to collect data. training content,
vi. Document the most appropriate technology to be used with specifications
vii. To review and update a detailed training plan
viii. To develop the Interviewer and Supervisor manuals
ix. Review of the budget
x. Clean dataset with clear syntax showing steps taken to clean data
xi. Document the report writing process including the number of days taken

2. Operations and Logistics subcommittee

Terms of references

The mandate of the members of this subcommittee was to implement all the aspects of planning and operations of the survey namely:

i. Develop a Gantt chart/ timeframe of the PMLLIN survey activities,
ii. Develop/ update the work-plan
iii. Develop the ACSM plan
iv. Review and update the Budget per task
v. Recruitment of the field personnel; interviewers and supervisors
vi. Manage procurement logistics - all items required to facilitate training and data collection
vii. Conduct training of the field personnel
viii. Transportation of teams in the field,
ix. Manage field activities
x. Data management- both data collection and analysis
xi. Communication both for advocacy and publicity and also operational.

APPENDIX E: SURVEY PERSONNEL

PRINCIPAL INVESTIGATOR
Dr. Waqo Ejersa

CO-PRINCIPAL INVESTIGATORS
Dr. Rebecca Kiptui
Christine Mbuli

SURVEY COORDINATORS
Elias Nyaga
Beatrice Machini
Paul Kiptoo
Robert Mwaura
Dr. Kiambo Njagi
James Ng'ang'a
Amin Awes
Godfrey Otieno
Jim Kirimi

ICT OFFICERS
Mutua Kakinyi
Paul Waweru
James Kiarie

STEERING COMMITTEE MEMBERS- M&E TWG
Waqo Ejersa
Rebecca Kiptui
Abdulkadir A. Awes
Christine Mbuli
James Kiarie
Beatrice Machini
Diana Menya
Mildred Shieshia
Daniel Wacira
Robert Perry
James Mwangi
Brian Mdawida
Charles Chege
Kakinyi Mutua
Paul Waweru
Dr. Jackie Kisia
James Sang
Patrick Igunza
Esther Kinyeru
Ato Selby
Margaret Njenga
Theresa Watwii Ndavi
Peter Njiru
Sophie Githinji
Jacinta Omariba
Pauline Lema
Jacinta Kandie
Kitetu James
Dr Hildah Essendi
Diana Omache

REPORT AUTHORS
Christine Mbuli
James Kiarie
Charles Chege
James Nganga
Abdulkadir A. Awes
Elias Nyaga
James Mwangi
Brian Mdawida

Field Team

Team.	Counties	Team members		Team.	Counties	Team members
Team No.1	Mombasa Taita Taveta	Paulina Dibo Hapile		Team No. 6	Kisii, Nyamira, Kericho, Narok	Saida Athman Ali
		Husna Shee				Zuleiha Adan Sora
		Jane Naliantoi				Fransisca Moruri Nyabisangwa
		Asneth Haiba Hiribae				Ann Muthoni Kinyua
		Khadija Abdulkadir				Samuel Kyalo
Team No. 2	Kwale, Kilifi	Abdia Huka Gulleid		Team No. 7	West Pokot, Trans-Nzoia, Uasin Gishu	Wario Boru Tole
		Asumpta Ndungwa				Simon Maina Mbugua
		Christine Karimi				Kelvin Komu Mutuo
		Shanice Zuena				Raphael Nzuva
		Anthony Sifa Kalama				Guyo Kanu Boru
Team No. 3	Kilifi, Tana River, Lamu	Fidelia Mbithi		Team. No. 8	Uasin Gishu, Nandi, Kericho	Mercy Ndichu
		Kauthar Hussein				Margaret Kamene
		Joseph Muia				Beth Kasele Joseph
		Omar Charo Malik				Joshua Kyumwa
		Dorcas Naneu Memusi				John Kimani Irungu
Team No.4	Busia, Siaya, Vihiga, Kisumu	Angeline Mutisya		Team No. 9	Kericho, Narok, Bomet	Hadija Galiti Jarso
		Quelence Adhiambo Okindo				Esther Naipanoi Moiyae
		Christine Katuku				Redemta Ngina Musuva
		Betty Wanja Rutere				Jeff Kerika
		Odhiambo Vincent Orao				Catherine Reuben
Team No. 5	Kisumu, HomaBay, Migori, Kisii	Bilacha Golicha Garse		Team No. 10	Vihiga, Kakamega, Bungoma	Faith Mueni John
		Unitah Moruri				Jillo Jatani
		Benson Obara				Vincent Muraya
		Daniel Kyalo				John Kinyua
		John Qalich Ramata				Cynthia Alwang'a Waswa

Buffer

1. Viola Jepto Kigen
2. Torome Winnie Naserian
3. Cynthia Nyiva
4. Edgar Wamocha

APPENDIX F: PLAN OF ACTION

Plan of Action for Mass distribution of Long Lasting Insecticidal Nets, 2017/2018 Campaign

2017-2018 MASS LLIN DISTRIBUTION CAMPAIGN GOAL AND OBJECTIVES

Goal

The goal of the mass LLIN distribution campaign is to reduce malaria related morbidity and mortality in the various epidemiological zones by two thirds of the 2007/2008 level, by 2018, by reaching 100% coverage of the population at risk of malaria and 80% utilization of the LLINs

Objective

1. Register 100% of household residents in the malaria endemic and epidemic prone zones;
2. Distribute LLINs to 100% of all registered household heads presenting vouchers at the distribution posts;
3. Sensitize 80% of beneficiaries on how to hang and use the LLINs throughout the year

Expected Results

1. 100% of household residents in the malaria endemic and epidemic prone zones are registered
2. 100% of all registered household heads presenting vouchers at the distribution posts receive appropriate quantity of LLINs for their members to achieve universal coverage
3. 80% of beneficiaries are sensitized on how to hang up their LLINs and use them throughout the year

COORDINATION

Coordination structures

Planning for the mass LLIN distribution campaign 2017/2018 will be at two levels, national level (macro-planning) and county/sub-county level (micro-planning), under the coordination of the National Malaria Control Program (NMCP) in collaboration with key national stakeholders.

1. National Level: There will be a National Steering Committee, composed of NMCP and all key malaria stakeholders, under the leadership of the head-NMCP
2. County Level – The CHMT and their stakeholders in the county chaired by the County Director of Health will coordinate campaign activities in the county
3. Sub county Level - The sub county which will be the main operational point of the campaign will be coordinated by the Sub-CHMT and stakeholders under the leadership of the Sub-MOH

There national steering committee will be supported by three (3) sub-committees:

i. Logistics and Procurement
ii. Advocacy Communication Social Mobilization
iii. Technical, Monitoring & Evaluation

National steering Committee (NSC)

The National Steering will provide the overall leadership and coordination of mass LLINs distribution 2017/18. The roles and responsibilities include

- Resource mobilization (human, technical, financial)
- Establishing and providing oversight to the three subcommittees;
- Validation of the campaign plan of action and budget;
- Validation of the campaign timelines;
- Monitoring of preparations according to the established timeline and resolution of bottlenecks where these arise;
- Supervision and monitoring missions to the county/sub-county where the campaign will take place before, during and after the household registration, LLIN distribution and hang-up activities;
- Validation of the results of the campaign (household registration, LLIN distribution and hang-up activities);

- Preparation and validation of the final campaign report, including lessons learned.

The National Steering Committee is composed of NMCP and key partners namely: WHO, PMI, PS Kenya, WV Kenya, Measure Evaluation, Amref Health Africa, The National Treasury, KeNaaM, UNICEF, KEMSA, KEMRI, KEMRI/CDC and KEMRI-Welcome trust

Sub-committees

There will be three sub-committees that will answer to the National Steering Committee:

1. Logistics and Procurement sub-committee

a. Develop a logistics plan of action (LPoA) based on national plan of action.
b. Estimate needs for commodities in consultation with the technical sub-committee;
c. Estimate transport requirements, including fuel for redistribution of supplies during implementation of campaign;
d. Establish Sub-county level logistics team (four to five people) who will be responsible for development of plans, control of finances and reporting;
e. Assess warehousing capacity and stock control and suggest possible solutions to challenges encountered;
f. Support county & sub-county level micro-planning;
g. Consolidate all sub-county level plans and requirements into national logistics plan for the distribution campaign;
h. Develop national logistics budget based on 7 (above) and submit to the technical and M&E sub-committee.
i. Develop detailed storage sites by sub-county and county.
j. Develop a Gantt chart (timeline) of logistics events and harmonize with national activity Gantt chart;
k. Develop training presentations for Sub-county logistics teams;
l. Conduct field storage reconnaissance trips as needed prior to LLIN deliveries to ensure that physical security measures are developed and put in place prior to LLIN movement/storage at all levels;

2. Advocacy, Communication and Social Mobilization sub-committee

a. Develop communication plan of action, including communication objectives and target audiences.
b. Develop timeline of ACSM activities, allocate responsibility for tasks and develop a budget s.
c. Develop key messages and supports (radio, television, posters, banners, etc.) for pre-, during and post-campaign.
d. Prepare advocacy documents aimed at:
    i. Government structures, beginning with the office of the head of state;
    ii. County and Sub-county health and political structures;
    iii. Partners, private sector businesses, stakeholders, religious and traditional authorities, etc.
    iv. Press/media
e. Organize campaign launch events (agenda, invitees, resource requirements, etc.) at national, county and Sub-county levels;
f. Develop guidelines for community mobilizers, traditional and religious leaders, health facility staff and others involved in the campaign to provide information and key messages.
g. Ensure that all materials are produced, pretested and validated on time for reproduction and transported to the lowest levels of the supply chain.
h. Organize media coverage for launch and first days of campaign. Where applicable, organize media coverage for handover of LLINs by the suppliers to the Counties.

3. Technical and M&E sub-committee

i. Develop and review detailed operational plan;
ii. Develop national budget for approval by the NSC;
iii. Develop macro operational budget and timeline;
iv. Determine human resource needs for beneficiary identification (and household LLIN allocation strategy) for LLIN distribution, for post-distribution activities, and for monitoring and supervision of activity implementation;
v. Calculate requirements for all management tools (household registration forms, vouchers, tally sheets, indelible ink markers, supervision checklists, monitoring tools, etc.) and ensure they are finalized, validated and reproduced on time.
vi. Support other sub-committees to develop and reproduce training materials, including campaign background, basic logistics, social mobilization/behaviour change communication (BCC) training, monitoring and supervision. Ensure that materials are produced for all phases of activity:
    a. logistics training manual and instructions for planning and implementation, as well as commodity management

assessment guidelines for post-campaign audit

b. social mobilization training manual and messages, as well as supervision and monitoring tools (or additions to existing tools)

c. Guidelines for implementation of campaign (mapping for household registration, guideline for household registration, distribution site set-up, supervision, messaging, technical forms, etc.)

d. Guidelines for monitoring, notably where and how end process monitoring will take place

vii. Develop and reproduce supports for trainers (central level), supervisors (County/Sub-county level) and health workers and volunteers (community or health facility level).

viii. Develop detailed training schedule for training of trainers (ToT), training at Sub-county level, etc. Determine the number and type of training sessions, personnel to be trained, and how many people at a time and for how long.

ix. Monitor and supervise implementation of all activities from initial County and Sub-county coordination meetings through microplanning and recruitment and training of personnel, to the household registration, LLIN distribution and post-distribution activities.

x. Develop coverage and utilisation evaluation protocol and questionnaire to assess effectiveness of all elements of campaign implementation, as well as the work of the sub-committees.

County and sub-county coordination

- The Campaign will be a stand-alone campaign where LLINs will be distributed at fixed posts. The campaign will be conducted in phases to achieve and maintain universal coverage in endemic & epidemic prone counties
- Seven (7) counties will distribute in the Q2 of 2017 calendar year, six (6) counties in Q3 2018, Eleven (11) counties in Q4 of 2018. Sub counties (Irrigation areas) will plan to distribute in Q2 of 2019.

County Level – The CHMT and their stakeholders in the county chaired by the County Director of Health services will coordinate campaign activities in the county

Sub county Level - The sub county which will be the main operational centre for the campaign will be coordinated by the Sub-CHMT and stakeholders under the leadership of the Sub-county MOH

The county & sub county teams will undertake micro-planning with technical assistance from the national steering committee. The county team will supervise all campaign activities in the sub counties.

- The sub county teams will be responsible for providing LLIN storage, transportation to the post, distribution and accounting for them.

LLIN PROCUREMENT AND PIPELINE MONITORING

The logistics of mass LLIN distribution are managed by a logistics Subcommittee of the national steering committee. All LLINs for distribution in Kenya, both routine and mass, must be WHOPES approved and also registered by the Pesticide Products Control Board (PPCB) of Kenya. Other specifications are given by the vector control Technical working group with approval by the Director of medical services (DMS)

In particular, mass LLIN campaign involves delivery of nets to communities to as close to their homes as possible. This entails several processes from quantification of needed commodities, products and services to actual delivery of LLINs to the final end users in households. Stringent logistics planning and management is critical for the success of the campaign. The logistics plan for the Mass net distribution campaign is described in Figure 4.

National Quantification	Using Census projections Comparison of projections with county and sub-county data
Nationa Procurement	Specifications International open-tender Evaluation and award of contract (Documentaion-Evaluation report and Award Contract) Pre-shipment evaluation (Documentaion: Pre-shipment reports) Call down plan-quantities and dates (Documentation: Call-down schedule)
LLIN Delivery	Storage assessment and security at all drop-off points (Sub-county/divisional/ward level) Security detail during holding time (Apprx 30 days) Delivery & LLIN Placement plan and quantities (Documentation: Distribution list) Delivery, Receipts and taking charge by sub-county health staff (Documentation-Delivery note and S12)
Delivery to distribution posts	Requision and delivery to posts (Documentation S11, desptach register & Bin cards) Storage and security detail at post (During distribution days approx 8 days) Procurement of local transport to the issuing post (Documentaion: Minutes of award and contract)
Distribution to End user Housholds	Village Registers Vouchers Bale quantity verification tool Tally sheets

LLIN need Quantification and Placement

Universal coverage with nets as per WHO definition for Kenya, means 1 LLIN for every two persons in the population within the targeted areas. NMCP will undertake a quantification process for the total LLIN need and all other relevant commodities. The quantification will be based on the projected population of the targeted areas from the 2009 population census results. This is verified using specific county data estimates which they have been using in their planning particularly health strategic plans. This process will be undertaken at least 1 year before the distribution time to cater for the procurement process lead times.

Procurement process

Once the quantification of LLINs and all other commodities and services is completed, procurement will be initiated at least 10 months before the set distribution dates. The procurement process is initiated by the NMCP through Kenya Medical Supplies Authority (KEMSA) for those LLINs and commodities to be funded using Global fund and Government funds using the Government procurement procedures and agencies. The LLINs and other related commodities to be funded through other partners such as PMI, World Vision and other partners supporting the campaign will be procured by the supporting partner using the applicable procurement procedures acceptable to the specific partner which must also conform to the Public procurement and disposal Act. The campaign will be a rolling one thus call down for delivery of the LLINs to the ward/divisional stores planned 30 days before distribution for every cluster of counties as per time interval based on the last distribution campaign. The call down with details of quantities, dates and delivery points will be advised by the National steering committee.

Strategic drop off storage and Placement planning

To avoid multiple handling and storage, quantification for placement in strategic stores within sub-counties will be done in collaboration with sub-county HMTS. This will be achieved through Micro-planning with the county and sub-county teams who will identify their strategic stores and the quantity of nets to be stored. The LLINs will be picked from these strategic stores to pre-identified distribution posts, a day before the distribution date.

Strategic storage assessment: Once the strategic drop off stores have been identified, a team comprising of the NMCP, KEMSA and County HMT will undertake an assessment of the stores to ascertain the appropriateness, storage capacity, security and availability of pallets and firefighting equipment. Any lack or inadequacy of any of the requirements will be mitigated against before the LLINs are delivered.

Pre-shipment LLIN Evaluation

Quality assurance of LLINs is an important task that must be done at different levels. Pre-shipment evaluation to assure quality and conformity of the LLINs to country specifications will be undertaken by NMCP and KEMSA. This will facilitate the issuance of the delivery clearance to the supplier.

Delivery and Taking charge of LLINs

To minimize multiple handling costs, the procurement contract will include shipment, clearing and delivery to the strategic drop off points in the target sub-counties (Divisional/Ward level). The supplier will be provided with the names of storage sites, names and phone contacts of health workers who will receive and take charge of the nets to be delivered. The supplier will then deliver the required LLINs per site where the identified officers will receive, verify the LLIN quantities and take charge upon signing the delivery notes including the formal vouchers such as S12. The officers will be required to retain a copy of the delivery notes. They will then enter the quantities received in the stores bin cards with all sufficient details recorded. At this stage, the number of nets will be based on the quantities per bale and the actual count done when the bales are opened during distribution. Quality assurance is also done at this level by KEMSA and witnessed by the County and Sub-county malaria control coordinator.

LLINs Movement and Security during Final Distribution

LLINs will be moved from the strategic drop off stores in the sub-counties to multiple pre-identified distribution Posts and suitably prepared by the sub-county Health management teams. These posts will be at health facilities, chiefs camps, schools, churches or any other suitable venue with minimum facilities such as tables/desks, crowd control convenience, and secure holding storage for LLINs during the distribution days. These Posts will have security during the same period of distribution who take charge from the day of placement to the final day of distribution to the end users.

Transportation of nets during movement of LLINs from Strategic stores to Distribution Posts will be done using contracted vehicles or Government ones where funds are used to pay contractors or fuel the government or partner vehicles. The control and accountability for LLIN movement will be vide the official requisition and delivery notes known as Form S11 whose copies are signed by the person supplying and the one receiving and a copy left at the storage facility. A register will be kept at every strategic store for recording of issues of LLINs destined for the posts. Copies of the requisition forms will also be kept both in the strategic stores and posts. The same document will also be used subsequently in case there will be inter- Posts issue or requisition during the distribution days which occasionally happens.

Tally sheets and summary sheets will be used to record the final issues to the end beneficiary households. A tool for LLIN bale quantity verification will be used during the distribution period to record the actual quantities for each bale opened.. These documents will be kept securely after the campaign for post campaign verification and audits.

LLIN DISTRIBUTION CAMPAIGN STRATEGY

For the purpose of the LLIN distribution campaign the definition of a household is as follows:

"A person or a group of people living in the same compound (fenced or unfenced), answerable to the same household head and sharing a common source of food and/or income. Domestic servants and other workers residing with the family members were included as household members." KNBS This definition is used by the Kenya National Bureau of Statistics in other surveys.

Macro-quantification of LLINs; personnel and other Needs

The National Malaria Control Programme in conjunction with other stakeholders conducts overall gap analysis on a regular basis to inform resource mobilization and prioritization. The gap analysis for LLIN need from 2017 – 2019 is contained in the finance section of the plan of action. The total LLINs needs are determined by the population projections from 2009 census data (KNBS, 2010). For universal coverage the total LLINs need is determined as total population for the target year of distribution divided by 1.8. This will give the crude LLIN needs and takes care of the households with an odd number of members. To cater for variances that will occur due to population projection estimates a buffer of 10% of LLINs is added. Based on this calculation the total LLINs required for the period is 14.8m. The complete table of population to be covered and the LLIN required for 2017 – 2018 is in Annex 1.

The distribution costs incorporate all other non-LLIN costs to ensure that the LLINs will reach the intended beneficiaries. These costs include advocacy, communication and social mobilization; sensitization and awareness creation; training of personnel; registration and distribution personnel; supervision, monitoring and evaluation of the process. The estimates of the requirements are based on the population and administrative units from village to sub-county levels. This assists in determining the numbers of registration and distribution personnel; the number and composition of supervisory teams; the quantities of ACSM materials needed. Historically, the non-LLIN costs have been estimated atUS$1.16 per LLIN. A desegregated cost estimate of the distribution costs is contained in the finance section and will become more accurate after the microplanning exercise is complete.

Micro-planning exercise

The National Steering Committee (NSC) will outline the key components and the process of the microplanning. This will include the objectives, programme and expected outputs. The NSC will prepare and finalise the tools to be used during the microplanning workshop, the registration and distribution tools and all other monitoring and evaluation materials needed.

Microplanning as part of the LLIN distribution process involves the engagement of sub-national teams (Counties and Sub-Counties) to expand the overall concept of distribution into a detailed budget and work plan inclusive of the activities ateach stage of the distribution process. The output of the microplanning process is the detailed plan for each County and sub-county.

The County and sub-county health teams will participate in the microplanning attended by the county directors, malaria coordinators, health information officers and two other members of the county health team. This workshop will be facilitated by the national Malaria Control Programme (NMCP) and partners. The Microplanning workshop will take five days and the all the counties and sub-counties in the phase of distribution will be expected to participate.

There are several outputs of the microplanning workshop. These include information on the sub-county population (projected from national census data); the number and type of administration units within the sub-counties (Villages, Sub-location, Locations and Wards); the details of the selected storage sites (Drop-off points) for holding the LLINs before delivery to the fixed posts for distribution to beneficiaries; The Gantt chart of implementation of the campaign for each of the county/sub-county; a plan for the social mobilization of communities for the purpose of household registration and distribution. This information is used to determine the LLINs required, the number of personnel needed for the implementation and to develop the detailed implementation budget for the counties and sub-counties.

The NSC will review the outputs of the microplanning workshop. The review is aimed at harmonization of the plans and costs. Further consultation with specific counties and sub-counties may be required for clarification of certain unique requirements such as hiring of additional logistics for transportation and/or storage of LLINs; Registration and distribution in challenged environments. The review process will generate the final plans.

The NSC will then schedule the start dates of the activities once consensus has been reached on the final plans. The implementation of the LLIN distribution is divided into three stages. The preparatory stage, the household registration process and the distribution stage.

Stage One: Preparatory Activities

The initial implementation stage of the distribution process is the preparatory stage. At this stage the counties will sensitize and create awareness of the planned distribution process through stakeholder engagement; train the registration teams; conduct social mobilization of the community. The outputs of this stage is the stakeholders at county and sub-county teams are aware of the plans and the processes of the distribution of the LLINs to the target communities. The sub-counties teams will have been trained on LLIN registration and the community will be made aware of the upcoming registration process.

Sensitization of Stakeholders at County and Sub-counties

Sensitization of stakeholders at the county and sub-county levels is important as it provides the entry point for the implementation process. Each County and sub-county will hold a one-day stakeholder meeting of approximately 50 participants during this stage.

The meeting will discuss the plans and schedule for the distribution processes, the role of the various stakeholders and implementers, appeal for cooperation and support for activities, create awareness within the county and sub-county leadership and opinion leaders.

The stakeholder meeting will bring together members of the health management teams; the local administration; political leadership; key departments including education; agriculture and others; stakeholders including religious and business leaders; partners working with the county/sub-county health departments. A typical meeting will have 50 participants and will be facilitated by the county/ sub-county health teams.

Stakeholders at the county and sub-county levels are aware and will support the activities during the registration and distribution stages. This sensitization assists the county/sub-county teams to manage the schedules for other activities.

Training of health workers as supervisors and TOTs

The registration of households will be undertaken by community level teams comprised of the local administration (Village Elders) and the community health volunteers (CHV). This process will be supervised at each administrative level by health workers and members of the administration.

The sub-county health management team will conduct a one-day training of the health teams to be involved in the supervision of the process at various levels and also to conduct the training of the registration teams. The training will cover the overall target of the distribution process at the sub-county level; the roles of the health workers; the tools to be used to capture and collate registration information; how to conduct the training for the registration teams.

Health workers who are based at the sub-location, location and the Ward levels. The total number required for each sub-county will vary according what is required asdetermined during the microplanning process. A training session should not exceed 60 persons for effectiveness.

Training of Household registration teams (Village Elders and CHVs)

Household registration is the most critical process that influences the success of the entire campaign.

The sub-county will facilitate the health workers trained in the previous step to facilitate the training of the registration teams. The training will focus on the operational definition of a household, how to complete the registration tool (Form 1a – Household register), the methodology of registration being household to household and the need for accuracy and transparency. During this training the emphasis will be on the registration section of the household register and how to handle unique circumstances like displaced persons, nomadic populations and those without requisite identification. A subsequent training on distribution processes will cover the distribution section of the same register. Based on the numbers required a sub-county may hold several training sessions in which both CHVs and Village elders will be in attendance. A typical training session should not exceed 80 persons.

The village elders from the respective villages know the people residing in their villages. Their role will be to identify village members and also the number of persons in each of these households. The Community Health Volunteer (CHV) works at the same level and provides health information and services to the community. They will be the ones actually completing the registers once the village elders have concurred with the accuracy of the information provided by the household head/representative. At the end of the training the supervisory teams will receive the household registers and summary tools. The registration teams will comprise of a village elder paired with a CHV coming from the same locality.

Key Outputs: Trained and paired registration teams; materials for registration will be distributed to the coordinators; registration dates finalised and communicated.

Social Mobilization for Registration

Social Mobilisation of communities contributes towards cooperation on the uptake of health related initiatives. The social mobilization for LLIN distribution takes place though various mechanisms, these are explained in detail in the communication section of the plan of action.

Social mobilization will be done through the local administration holding community level meetings (barazas) to sensitize the community members on the registration and distribution process, the dates and what is expected of each household within the sub-county. The health workers at that level will participate in these meeting to clarify and emphasise the important issues. These meeting may also address other issues of community interest. Health workers will also use interpersonal communication (IPC) to reach out to community members through health facilities and also conduct mobilisation through the use of megaphone mounted on vehicles that will criss-cross the various key areas of the sub-county with a focus on markets-days and shopping centres. Other methodologies used will include partners engaging communities and also the education department passing messages through the school system. The social mobilization may extend into the initial days of the registration process.

Key outputs: The community is aware of the registration process and dates and are ready to receive the registration teams at their homes.

Stage Two: Household registration

The household registration is the main step in the second stage of the overall distribution process. It is also the most critical component as it determines the actual LLIN requirement, the population to be covered and the placement of the distribution posts.

The registration process will take five days preferably continuously. The process is structured such that weekends are included to capture those who may not be available during normal working days and hours. A registration team composed of a village elder and community health worker will visit each household within the village and collect the following information: name of Household head/representative. The Identification No. of the household head/representative and the number of persons in that household. This information is filled into the household register by the community health worker after concurrence by the village elder regarding accuracy. (See Annex XX for sample). The register is in triplicate; the original is kept at Ward level to be dispatched to the posts at the time of distribution, one copy is stored sub-location and other at the Ward level for records. The information is summarised in the sub-location summary tool which will have the names of the village, the number of households and the population in each of the village (See Annex XX for a sample). The information is verified by the local administrator (Chiefs and Assistant Chiefs). The sub-location summaries are again summarised to the location, ward and sub-county levels. The summaries are used to determine the location of posts and the number of LLINs for each post.

The village elder and community health volunteer to undertake the exercise; community members to cooperate and provide accurate information required; local administration and sub-county teams to provide oversight in conjunction with the county health teams; national level to support the counties.

Key Output: Complete and verified household numbers and population figures at each level, the summaries for the various administrative levels generated from household registers.

Supervision of Household registration

The household registration process involves a large number of persons over several days. To ensure consistency and accuracy of the information close supervision is planned at various levels. The supervision is undertaken by the health worker and members of the local administration at the various levels. The supervision levels are: Sub-location, location, Ward, sub-county and County levels. Issues arising during the registration process are escalated as needed and resolved. Each registration team should be visited at least once a day during the five-day registration period.

Health worker and local administrator at each administrative unit level to provide close oversight of the process. Sub-county and county health teams to ensure consistency and completeness of the registration exercise. The national team to provide overall stewardship and mentorship.

Collation, cleaning and summarising of the household registration process

At the sub-county level, the information collected during household registration is cleaned for any inconsistencies that may have occurred during the process. The final summaries for each sub-county form the basis of the sub-county report for the registration stage. This information will guide the distribution of the posts and determine the number of LLINs for each post.

Preparation of distribution through sensitization

Distribution will be done at fixed posts whereby the community members will be collecting their nets at a localized government (hospitals and schools) and religious institutions identified by the sub county health management teams. A post by definition is a central temporary point near the community where nets are stored few days to and during the distribution days for ease of accessibility. Each post will be manned by three community health volunteers, a village elder and a health care worker who will serve as the post supervisor. The distribution of collection posts will depend on the population estimates per Sub County. The distribution process involves a series of activities including sensitization of stakeholders, training of health workers and subsequently the community health volunteers and village elders. There will be social mobilization involving the health workers and the provincial administration like the chiefs and sub chiefs through interpersonal relations and dialogue.

Sensitization of all key stakeholders at both the county and sub county level is critical due to the roles played by all at various level of the campaign. Involving the stakeholders like in preparatory phase will facilitate timely and proper distribution exercise as well as granting support. The county and sub-counties will hold stakeholders meetings for sensitization of distribution at their respective headquarters. The key stakeholders will be drawn from the provincial administration like the chief, sub chiefs, religious leaders, youth leaders, county administration and political leaders. This will be a one-day sensitization meeting highlighting the processes, modalities, the actual dates of distribution and the roles of the different parties with regard to the distribution exercise. The county will hold its stakeholders meeting a day prior to the sub county meeting because they have an oversight role in supervising their respective sub counties at all levels including the stakeholders meetings.

Subsequently, there will be a one-day health care worker training by the sub county teams on distribution tools and the monitoring of the activity. These will involve the public health officers, nurses and public health technicians manning the health facilities and different health administrative units. They will be taken through tally sheets which is the source document at the post indicating the actual number of nets issued per day and this is summarized into a daily summary tool that ultimately feeds into sub location summary. The trained health care workers will train the community health volunteers (CHVs) and the village elders (VE) at different sites on their roles and responsibilities as well as the monitoring tools indicated herein. At each training site, there will be three facilitators and a class not exceeding eighty (80) participants depending on the population at the sub county level.

Social mobilization for distribution

The social mobilization is an ongoing process right from the preparatory stage through to the distribution. This is a critical process that helps in creating awareness at all levels right up to the community level and therefore facilitate good uptake of LLINs. The information is packaged in a manner in which the common man will understand and further dissemination to contact persons at any time. It will be done at two levels including use of the provincial administration and the health workers. The health workers will move in a hired vehicle loaded with public address system (PAS) in all corners of each sub county announcing the dates and importance of net collection to the registered persons. Information education and communication materials will be mounted in the hired vehicle as well as strategic points within the sub counties which include health facilities, religious institutions as well as chiefs and sub chief offices.

Level two of mobilization will involve interpersonal communication whereby chiefs, sub chiefs, wards and sub-county administrators will engage the community during the community level meetings (Barraza's) on the best methodologies to increase uptake. The religious leaders will be utilized to pass the messages across to their congregation.

LLIN distribution to the post

Prior to the distribution day, the LLINs will be distributed to the designated distribution posts within the sub county by use of hired Lorries and other means. The existing government of Kenya procedures and documentation will be applied right from the drop off points to the posts. This will involve use of forms S11 and S13 for issuance and delivery note. The distribution at this level will be done by the divisional heads in collaboration with the public health technicians for the respective administrative health units.

The distribution exercise will be conducted for five days inclusive of two weekend days to capture the people who will not be available during the working days. During the distribution day, a village elder will control the crowd, one CHV will verify the name of the community members from the register and tallying, one CHV for issuing the voucher, a health care worker will be the supervisor as well as issuing the net and one CHV for hung up demonstration.

Supervision of the distribution

Supervision of the activities is crucial at all levels due to the procedures and processes involved. Failure to supervise an activity at any level may lead to gross and serious outcomes of loss, mishandling and late execution of the activity. This will be done at four levels including; National, county, sub county, ward and location. The global fund team Kenya will provide an oversight supervisory role directly to the counties together with the National Malaria Control Program (NMCP). The ministry of health through the NMCP will provide the technical as well as the financial support to the county and sub counties.

CAMPAIGN COMMUNICATION STRATEGY

Communication will be integral tothe entire mass net planning, implementation and post distribution for the success of each of the planned activities. Communication will be packaged specific to each planned activity from pre-registration, household registration, net distribution and post distribution campaign. The following section describes each activity and associated communication package in detail:

Pre-campaign communication period

Advocacy Meetings at national, county and sub-county level

To create a reference framework at national and county level, mass net steering committees will be constituted at both levels. These steering committees will be meeting frequently with frequency increasing towards the campaign period.

Awareness creation at both national and county level

To raise awareness and increase ownership of the mass LLIN distribution process by the target counties and sub-counties, an introductory letter will be written by the Principal Secretary to the county and the sub-county teams through the council of governors. The letter will describe the purpose of the campaign, the planned activities, the targeted counties, and the period of the campaign.

Development of the campaign messages

The National steering committee through the ACSM sub-committee will develop campaign messages which will be presented to the ACSM TWG for approval. With support of partners, Creative agencies will be engaged to design the artwork. Procurement of IEC materials will then be initiated for production of ACSM materials All these activities will be done three months prior the campaign to allow for adequate preparations for the campaign and procurement lead times.

Registration period

To create awareness of household registration exercise, the communication messages developed will be aired using multiple channels to reach the highest proportion of the target audience. The registration messages will revolve around the dates and what is required for registration. The channels will include the following;

- Inter-personal communication through community mobilizers, chiefs and village elders who will pass the information during markets days, churches, funerals, weddings, Barazas, chamas and any other social gatherings.
- Airing messages on registration through Mass media e.g. through local vernacular radio talk shows and spots, TVCs and road shows.
- IEC materials e.g. T-shirts, Caps, Bags, Umbrellas with mass net campaign messages will be distributed and used by the teams conducting registration. Posters with specific dates when registration will be conducted will be displayed at strategic points such as schools, churches, health centres, shopping centres. This will increase awareness for the target audience
- During registration training, the curriculum will include orientation on ACSM for net use.

Distribution period

To create awareness of the LLIN distribution exercise, the communication messages developed will be aired using multiple channels to reach the highest proportion of the target audience. The distribution messages will revolve around the dates, distribution posts and what is required for claiming nets. The channels will include the following;

- Inter-personal communication through community mobilizers, chiefs and village elders who will pass the information during markets days, churches, funerals, weddings, Barazas, chamas and any other social gatherings.
- Airing messages on LLIN distribution through Mass media e.g. through local vernacular radio talk shows and spots, TVCs and road shows.
- IEC materials e.g. T-shirts, Caps, Bags, Umbrellas with mass net campaign messages will be distributed and used by the teams conducting LLIN distribution. Posters with specific dates when distribution and the actual posts will be displayed at strategic points such as schools, churches, health centres, shopping centres. This will increase awareness for the target audience
- Hang up campaigns at the distribution post and thereafter in the community will be conducted to ensure sustained behavior around net use.
- During LLIN distribution training, the curriculum will include orientation on ACSM for net use.

Post Distribution Campaign period

To ensure sustained net use behavior post-distribution, a multi-channel approach will be employed through mass media, out of home advertising and interpersonal communication through CHVs. This will ensure the target audience sleeps under the LLINs for maximum impact.

MONITORING AND EVALUATION

Monitoring

The objective of monitoring the mass net distribution is to inform the programme and implementers of the progress and status of the mass campaign activities. To this end several tools have been developed to monitor the micro planning exercise and the distribution exercise. Below is a description of the tools and how the data will be managed.

Data Management and Tracking Tools

Data Management refers to all the processes involved in collection, collation of information about household members, LLINs required, distribution post record information, identification of household heads, tallying the LLINs issued to households and collation of this information to higher levels; village, post, sub-location, division/ward, sub-county and County. The registers, voucher cards, cards tally sheets, S11s, chief's stamp are all tracking tools used to collect and verify the information collected.

The national steering committee will develop micro-planning tools/net tracking and disseminate to the counties and sub counties based on the previous distribution exercises. A dash-board will be developed to depict the progress of the distribution at national, County and sub county level. This shall be presented during the National Steering Committee and TWG meetings at all levels. The dashboard will collate al information that has been gathered from the summary forms.

The national team will mentor the counties and sub-counties during micro-planning and throughout the campaign on the tools that have been developed so that they use the information that has been gathered for decision making at their level.

The Sub-county and county teams will prepare and submit micro-planning and distribution reports that will be compiled at national level. Micro-planning reports will include a description of the household registration exercise, and the financial component, challenges and recommendations.

Distribution reports in form of S11 and bin cards or their equivalent including tally sheets and their summaries. This should be completed and handed in daily. The summaries of the tally sheets should be collected by the supervisors.

After the activity, the national, county and sub-county teams will submit the supervisory reports for filing.

A meeting will be convened with all the key stakeholders involved to discuss and document the successes, challenges, lessons learnt about the concluded activity.

Micro-planning Data Flow

The micro-planning data flow is the transmission of data through a set of tools designed to collect, collate and document number of persons in each household to determine the total population and hence the number of nets required at various levels.

The Village Register

During the registration of households this tool will be used. It will move from house-to-house and capture household information The Village Register will collect information on the name of the household head, ID number of the household head and lists the number of people in the household. This register will be produced in triplicate copies. One copy will remain with the Chief, another copy with the Public Officer in charge of the sub-county Ward and another copy will remain at Sub-County level. A sample of the Villages Register can be found in Annex 2

Registration summary tools

After registering the villages in the sub-location, the village registers will be forwarded to the assistant chief for certification. The summary at the bottom of each village register will be recorded in sub-location summary forms which contains information about the names /number of posts in each sub-location, and the number of nets required and the number of people in each village. The sub-location summary forms collate data; number of people in the sub-location to the Division/ward summary form. The division/ward summary collates data; names of the divisions, number of people in the division/ward and consequently the number of LLINs required in each division/ward into a sub-county summary form which collates to the county summary form. The soft copy of the County summary form will be transmitted to the national level for entry into the data base. The registration Summary Tools can be found in Annex 3

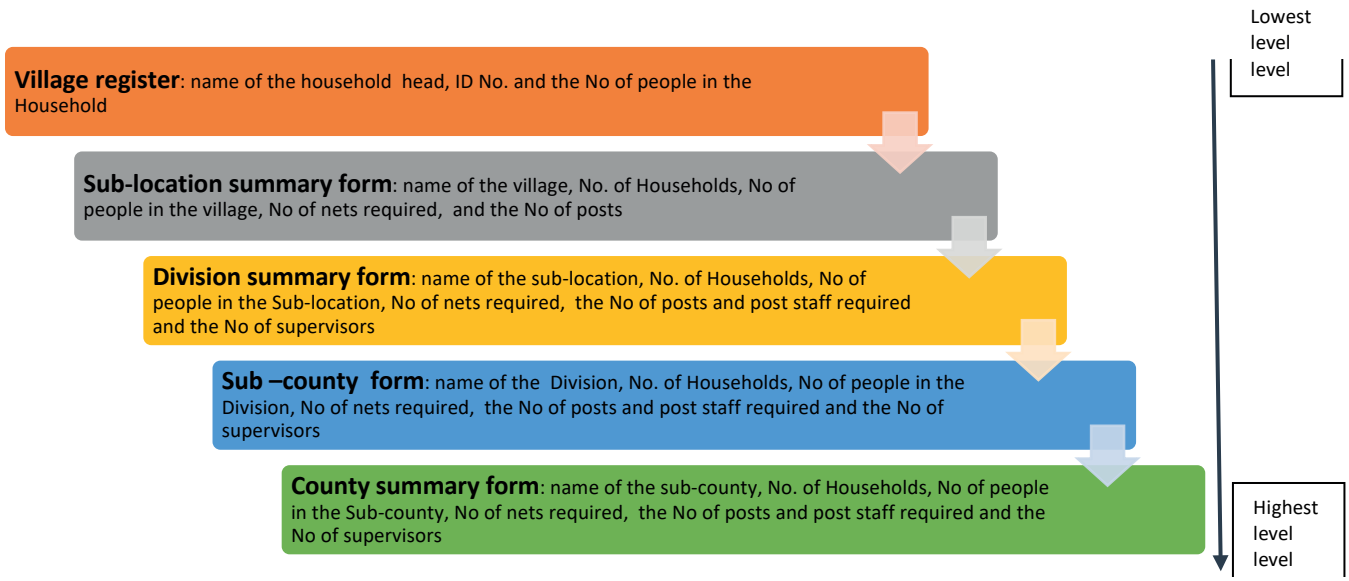

Figure 4. Micro Planning Data Flow

Distribution Tools

The distribution tools will be used to record data on distribution of LLINs to the end users. The Village Household register will be a copy of the register populated during micro-planning (described above in the micro-planning tools).

Village Register and Voucher

During distribution, the person collecting the LLINs will be expected to identify himself at the post by producing the ID card of the household head. After identification, the persons manning the post will then cross out his/her name from the register and issue him/her with a voucher indicating the number of nets allocated to his household. The number indicated on the voucher will also be indicated on the stub for stock management. The Household head will then redeem nets using the voucher. Please see a sample of the voucherin Annex 4.

Tally Sheet and Post daily Summary

The person issuing the nets will then tally the number issued in a tally sheet. At the end of each day the totals are recorded into a post daily summary and data from each post is transmitted to the Division/ward summary indicating the names of each post, closing balance, number of nets distributed and the population protected. The following day, the person issuing the nets will start tallying afresh ona blank tally sheet. Please see the tally sheet and the post summary in daily Summary. The summaries of the tally sheets should be collected by the supervisors

Summary Sheets

The post daily summary will be summarized into the Division/Ward summary sheet which in turn will be summarized into the sub-county summary. The sub-county summary will contain the names of the divisions/wards and; the closing balances, nets distributed and the population protected. The totals of each sub-county summary will be conveyed to the county summary. A copy of the County Summary tool will be transmitted electronically to the national level for it to be entered into the data base.

Village Household register	• The name and ID NO of the Hh head • The No of nets required.
Voucher	• Number of nets due to each Household will be filled on the voucher and on the stub
Tally sheet	• Shows the No of LLIN distributed in a post • Fill a new tally sheet every single day
Division summary	• The name of post, the closing balance, the nets distributed and the population protected
Sub county summary	• The name of the division, the closing balance, the nets distributed and the population protected
County summary	• Name of sub county the closing balance, the nets distributed and the population protected

Mass LLIN Campaign Reports

Micro-planning reports:These will include a description of the household registration exercise, and the financial component, challenges and recommendations.

Distribution reports: The distribution reports will include a description ofthe distribution exercise, the achievements as per the data collected from the distribution tools. This should be completed and handed in daily.

Supervisory reports:

A supervisory checklist will be developed and shared with all the supervisors prior to registration and distribution to standardize the supervision. The divisional/ward supervisors/coordinators will avail the templates as well as coordinate the team leaders on a daily basis and for the routine supervision.

In addition to this, the county and sub-county supervisor is to have a daily meeting with the divisional coordinators where they will hand over the summary reports of their divisions on the previous day's distribution.

The national and county supervisors will hand over their reports once they have left the field to the national office. They will receive the summaries and reports of the sub-Counties that they are supervising.

Independent monitors will hand over their reports to the national office or to the national supervisors who may be in the field with them at that time.

Sub Counties report should have a technical component and a financial component. The M&E sub-committee will determine the outline of the reports and the indicators that will be reported against.

Counties reports: Should have a technical component and a financial component. The M&E sub- committee will determine the outline of the reports and the indicators that will be reported against.

National report: Will be fed by the Sub County reports, supervisory reports and distribution reports. The copies of the Sub counties reports in a particular County will send a copy of their reports to the County apart from sending it to the national level. Samples of report outlines are in the annex 5.

Evaluation

Post-campaign evaluation will be carried about 2-6 months after the distribution exercise. This will be coordinated by the M&E sub-committee and ratified by the M&E TWG (which has several partners including KEMRI/CDC, KEMRI/Welcome Trust, PSI, and KNBS). The protocol of the survey will be passed by the Kenyatta National Hospital/University of Nairobi Technical and Ethics Research Committee. The main objective would be to establish the net availability within the households, net retention within the households, and net use by the different household members and communication concerning associated with the campaign.

The specific objectives would be to:

1. Measure household ownership and use of any LLIN or Campaign LLIN.
2. Measure household retention of campaign LLINs.
3. Determine household access to LLINs
4. Measure respondent exposure to LLIN messages

The questionnaire tools will be adapted from MERG as it has been in previous surveys and will be electronic.

The survey will be a household survey The results will be disaggregated into endemicity region, residence type, gender and social economic status. The sampling will be done using the sampling framework for Kenya and will ensure that a representative sample will be gotten. The National Beuareu of statistics will do the data quality checks and the Census Survey Processing Software (CSPro) will be used for data entry, editing, weighting, cleaning and tabulation. Data editing and cleaning will include range checks, structure and internal consistency checks. The data file will be kept on a separate network so that only authorized survey staff will have access to the data during the processing phase. This file will be used to produce tables for the final report. More details can be found in the survey protocol used for the 2014/2015 mass net distribution evaluation Survey in Annex 6.

The final report will be disseminated to all stakeholders and Counties that participated in the exercise. The results of the report will be used to improve on future similar exercises, in the design of interventions that may be needed to improve net coverage or net use (e.g. net hang up or messaging).

SUSTAINING GAINS: MOVING BEYOND SCALE-UP

Kenya adopted the policy of universal LLINs coverage under the 2009-2017 National Malaria Strategic plan. The country maintains a policy of mass LLINs distribution every 3 years. So far the country has undertaken two rounds of mass LLIN distribution. To maintain this universal coverage, the country conducts:

- Routine distribution in public sector though ANC and EPI/child welfare clinics
- Social marketing
- Promoting net use through advocacy and social mobilization

Moving forward the country proposes to supplement the 2017/18 LLIN distribution by sustaining the routine LLIN distribution

- Routine distribution in the public sector (Including FBO/CSO managed facilities): Kenya will maintain and sustain the policy of issuance of LLINs to pregnant mothers at every pregnancy on their first visit to ANC clinic. Likewise, all children under age of 1 will be targeted during their first immunization visit or at delivery. The net is offered free of charge and with no conditions. The focus areas are the epidemic and endemic regions of Kenya. The country targets annual distribution 2.5 million LLINs annually. The public facilities provide easier access and utilizes existing structures for distribution, reporting and accountability.
- Distribution through social marketing: Community Based Organizations will be used in promotion of social marketing and use of LLINs. Subsidized LLINs are given to these organizations who will in turn sell to the community members at some marginal profits. This aspect aims to address the coverage gap between the mass and routine LLIN distribution.
- The country is proposing to undertake an assessment of existing and innovative channels of distributing LLINs. Initial assessment has been initiated and the findings will inform NMCP policy on distribution of LLINs. A pilot on community based continuous distribution LLINs has been undertaken in Busia County and the results will further inform the viability using this channel. This approach will utilize the existing National Community Health Strategy and networks of community units and community health volunteers (CHVs). In this pilot the CHVs visit household to assess Net use and conditions of the net. The pilot built capacity of CHVs on Net repairs and maintenance.
- Promotion of net use: NMCP and partner will continue to supports Net hang-up campaign targeting the general population through mass media, Community Health volunteers, school health net promotion campaign and use of community malaria champions.