UNDEHSTANDING USER PREFERENCES OF LLIN LENGTH/HEIGHT, COLOUR, SHAPE AND TEXTURE: A QUALITATIVE STUDY

REPORT

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Understanding Users Preferences Of LLIN Length/Height, Colour, Shape and Texture: A Qualitative Study Post Mass LLIN distribution

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This qualitative study was conducted following the inconclusive results on preference of net length/height in the quantitative evaluation which was conducted after the implementation of the 2017/2018 Long-Lasting Insecticidal Nets (LLINs) Mass Distribution Exercise – (PMLLIN 2017/18). The PMLLIN quantitative study of 2018 conducted 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 sought to, among other things, investigate respondents’ preference of net length/height between the shorter (180cm) nets given out in 2017/18 and the longer ones (210cm) given out during the 2014/15 mass net distribution. This qualitative study was necessitated by the inadequate findings around preferences of the longer vs the shorter nets and the inability to determine whether despite preference, users can still use the shorter LLINs. Findings from this study will help inform policy and planning for the procurement of nets for subsequent mass net distribution. The study will also further help increase understanding of the process and outcome of the mass distribution registration and distribution process and will help improve subsequent net distribution efforts, including communication strategies undertaken as part of the exercise.

The study was designed and carried out by HCM through Population Services Kenya (PS Kenya) working with the National Malaria Control Program (NMCP) of the Ministry of Health through funding from United States Agency for International Development (USAID)'s Presidential Malaria Initiative (PMI) office in Kenya.

The opinions expressed in this report are therefore those of the authors and do not necessarily reflect the views of USAID/PMI.
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<th>Description</th>
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<tbody>
<tr>
<td>AMREF</td>
<td>African Medical Research Foundation</td>
</tr>
<tr>
<td>ANC</td>
<td>Ante Natal Clinic</td>
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<tr>
<td>CHEW</td>
<td>Community Health Extension Worker</td>
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<td>CHPO</td>
<td>County Health Promotion Officer</td>
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<tr>
<td>CHV</td>
<td>Community Health Volunteer</td>
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<td>CMCC</td>
<td>County Malaria Control Coordinator</td>
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<tr>
<td>DCE</td>
<td>Discrete Choice Experiments</td>
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<tr>
<td>DO</td>
<td>Division Officer</td>
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<tr>
<td>ESRC</td>
<td>Ethical and Sensitive Review Committee</td>
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<tr>
<td>FP</td>
<td>Family Planning</td>
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<tr>
<td>HH</td>
<td>Household</td>
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<td>HHH</td>
<td>Household Head</td>
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<tr>
<td>ID</td>
<td>Identity cards</td>
</tr>
<tr>
<td>IPTp</td>
<td>Intermittent Preventive Treatment in Pregnancy</td>
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<td>ITN</td>
<td>Insecticide Treated Nets</td>
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<tr>
<td>KII</td>
<td>Key Informant Interviews</td>
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<td>KMIS</td>
<td>Kenya Malaria Indicator Survey</td>
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<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
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<tr>
<td>LLIN</td>
<td>Long Lasting Insecticide-treating Nets</td>
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<tr>
<td>LNGO</td>
<td>Local Non-Governmental Organization</td>
</tr>
<tr>
<td>MCH</td>
<td>Maternal Child Health</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NMCP</td>
<td>National Malaria Control Programme</td>
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<td>NTV</td>
<td>Nation Television</td>
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<td>PHO</td>
<td>Public Health Officer</td>
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<td>Public Library of Science</td>
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<td>PMI</td>
<td>Presidential Malaria Initiative</td>
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<td>PMLLIN</td>
<td>Post-Mass Long Lasting Insecticide-treating Nets</td>
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<td>PS Kenya</td>
<td>Population Services Kenya</td>
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<td>RA</td>
<td>Research Assistants</td>
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<td>RUT</td>
<td>Random Utility Theory</td>
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<td>SCMCC</td>
<td>Sub County Malaria Control Coordinator</td>
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<td>SM</td>
<td>Social Marketing</td>
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<td>TV</td>
<td>Television</td>
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<td>UC</td>
<td>Universal Coverage</td>
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<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WHOPES</td>
<td>World Health Organization Pesticide Evaluation Scheme</td>
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<td>WTB</td>
<td>Willingness to Buy</td>
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<td>WTB/P</td>
<td>Willingness to Buy and Pay</td>
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<td>Willingness to Pay</td>
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EXECUTIVE SUMMARY

Use of long lasting insecticidal nets (LLIN) as one of the main and most economical vector control strategies in Kenya is mainly implemented through free routine distribution to children under one year of age and to pregnant women at public health facilities, and scaled up by mass LLIN distribution exercises to households which happen every three years in Kenya. It is through these channels that the country can achieve and maintain the World Health Organization’s recommended universal coverage (one net for every two people at a household) objective. The most recent mass LLIN distribution conducted from July 2017 to March 2018 saw more than 15 million LLINs distributed in malaria endemic and epidemic areas in Kenya, specifically areas around the Lake, Coastal, and Rift Valley regions. This exercise aimed to cover about 30 million people at risk of getting malaria and residing in counties in these regions.

As happens after every mass LLIN exercise, a quantitative survey is conducted to assess whether the nets given out have indeed reached those targeted. These studies, often referred to as the Post-Mass LLIN (PMLLIN) Surveys seek to assess a number of things including; i) net availability at households visited; ii) net retention at households visited; iii) net use at households visited, further assessing the individuals using these nets; and iv) perceptions/experiences with the campaigns implemented during this exercise which aim to encourage uptake. The 2018 PMLLIN Survey sought to assess in addition, preferences of several attributes of nets, including length/height (short or long), shape (conical or rectangular), colour (blue and white) and texture (polyester or polyethylene. Findings of assessment of preferences of these attributes were however inconclusive as there were mixed/unclear responses. Asked which LLINs were shorter, between those given out in 2014/15 (longer - 210cm) and 2017/18 (shorter - 180cm), a third (33%) of respondents in the study reported the 2017/2018 nets to be longer, 19% reported the 2017/18 ones to be shorter, 7% reported them to be of the same length/height as the 2014/15 ones whilst another third (32%) hadn't received the 2014/15 LLINs. Further, 68% of those responding preferred the 2017/18 LLINs when asked to choose.

A lack of clarity in these responses necessitated a further investigation of these preferences, with a great focus given on length/height and shape of LLINs. The current qualitative study was, therefore, the answer to this enquiry and sought to delve deeper into these preferences. It further sought to understand the effect of these preferences on net use. Specifically, the study sought to understand if and how net height, shape, texture and colour affect net use as a primary tool for vector control. This study also sought to explore and understand the effect of the most recent mass net distribution, the process of registration and distribution of nets during the campaign and concurrent effect on net ownership and retention.

This was a participatory study that utilized group sessions as well as Key Informant Interviews. Researchers conducting this study employed Discrete Choice Experiment (DCE), Experiential Hanging Sessions and Key Informant Interviews to address the study’s objectives.
An ordinal preference method was applied in the DCE and asked participants to choose between two or more alternatives, where each alternative was described. The experiential LLIN hanging sessions, on the other hand, were employed to observe and document actual net hanging by participants in real households doing this with the various sleeping spaces in the households selected for the exercise.

The study was conducted in 11 counties in malaria-endemic and epidemic zones in Kenya, including the highland epidemic region (Uasin Gishu and Kericho counties), the coastal endemic region (Kwale, Kilifi and Taita-Taveta) and the lake endemic region (Bungoma, Vihiga, Busia, Migori, Homabay and Siaya). Mombasa and Kisumu counties were used as pilot sites to test both the tools and the data collection approach to aid in planning for the study. A total of 44 group sessions were conducted with both men (11 group sessions) and women (33 group sessions) from households that both received and those which did not receive LLINs during the 2017/18 mass net distribution exercise. In addition, 48 Key Informant Interviews (KIs) were conducted across the study sites with Community Health Extension Workers (CHEWs), Community Health Volunteers (CHVs) Village elders and with various other personnel at sub-County, County and National levels, who were involved in the exercise.

Summary of Findings

Net attributes and use

Overall, participants preferred longer (210 cm or longer), conical, blue and soft/polyester LLINs. Further, a majority of those participating in the study ranked height as their first most priority attribute to consider in the selection of a net, although this varied slightly by region – height was the second most preferred attribute after shape, in the highland epidemic area. Otherwise, a majority (82%) of those engaging in this study regard height as the most critical attribute of an LLIN that is likely to influence use. The shape of the net follows at 79%, with texture ranking at 74% and colour coming in last, at 66%.

The experiential net hanging sessions clearly showed almost all the participants preferring and appreciating the longer (210 cm or longer) LLIN. It was clear that longer LLINs presented fewer challenges when hanging over a sleeping space as they fit the sleeping space better and were easy to tuck in. Longer LLINs were found to be even more important when the sleeping space was either on the floor or a sofa seat. On the flip side, the difficulty of fitting a sleeping space on the floor arose as the major drawback of the shorter (180cm) LLINs, an observation made on the LLINs distributed in the 2017/18 exercise which are shorter and tougher/polyethylene. Despite these challenges, it was clear that community members employ several strategies to work with shorter LLINs. Since this was a group exercise, participants shared ideas on strategies which were used to hang up the LLINs. These included the use of extended ropes with the provision of the loops on the nets; the use of cloth hanging lines to fit the LLINs instead of tying them on the walls; and the use of stools, rocks and harmers to hold each side of the net. The respondents further indicated that the challenges...
faced when using the shorter nets contributed to them preferring to use the older and longer ones and keep the newer ones in their packaging. Preference for conical shaped LLINs also emerged with the advantages including the ease of hanging – since they only need one point to hang; ease of folding up after use and the fact that they did not need a lot of effort to hang them up, especially when household members use sleeping spaces for other roles during the day. It is important to note that although these coping strategies were evident during the communal net hanging sessions, they arose from the fact that these sessions were done in group settings. There was a clear gap in individual participant ideas or efforts they employed in their houses to mitigate the challenges of working with shorter LLINs. These strategies were evident in counties where CHVs were actively involved in an exercise where they demonstrated how to hang LLINs, including in Kwale, Migori and Bungoma counties. There was clear inconsistent use of LLINs where those hanging short LLINs struggled putting them up, hence gave up on the efforts.

Net registration and distribution

Use of the community health strategy and other administrative and local leaders was highlighted as an excellent platform for the registration and distribution of nets. The use of CHVs, village elders, use of identity cards (IDs) during registration, use of the universal coverage (1 net for 2 persons in a household) approach to determine number of LLINs to give to households, timing of the registration (either during planting season, election period and daytime when members are not at home) were some of the factors that influenced registration and hence net acquisition and ownership. In most counties, village elders and other administrative officers played a vital role during the mobilization and registration process. Despite the challenges of ensuring coverage of all households during registration by increasing the time allocated and funding, this approach helped increase reach and access to nets. It was however suggested that, the inclusion of a mop-up strategy to cater for households that are left out either during registration be incorporated as a critical component with the potential to improve coverage during subsequent mass LLINs distribution exercises.

Communication plays a key role in the registration, distribution and behavior change to foster use of LLINs. To ensure the desired outcomes of consistent net use, communication for registration, net distribution as well as SBC was evaluated in this study. Findings indicate that during both the registration and net distribution exercises there was a significantly wide reach of communication on this exercise due to the various efforts employed, including mass media channels such as radio, television (TV) and community based initiatives using public address systems, as well as the use of administration and community elders and community health workers. Further suggestions to make the exercise even more successful included ensuring communication coverage and period during the mass net exercise is extended and time is planned away from politics and seasons where a majority of household members are unavailable in the household and have tracer strategies to ensure higher coverage. The need to clearly articulate the importance of IDs in the registration, and consequently, distribution
of LLINs, need to also be made clear during the communication as there seemed to be some insecurity among households when asked for IDs, especially as this happened around election time, where there often exists a number of insecurities and safety concerns.

Both the “Shujaa” and “Maliza Malaria” campaigns had started their implementation for 3-6 months. The reach was primarily through the mass media channels, especially local radio and TV channels and through community level initiatives, specifically, health care workers and posters in health facilities. Although for both campaigns, reach was modest, the case was better for the ‘Shujaa’ campaign where reach and knowledge of the desired behavior was above average in the three counties where the campaign has been implemented through CHVs. These counties are Kwale, Bungoma and Migori. A gap was observed regarding use of posters; their reach was quite low. This indicates that use of posters as placement was a better approach. This is because posters better serve as a rider and as aid to other modes of communication. The low reach calls for more efforts, some of which should incorporate scale-up the use of CHVs.

Conclusions

Preferred net attributes: Households prefer longer, conical, blue and soft/polyester LLINs because it facilitates the consistent use of LLLIN.

Net hanging coping strategies: Communities employ various coping strategies to ensure that shorter nets fit on their sleeping spaces, such as; the use of extended ropes with the provision of the loops on the nets; use cloth hanging lines to fit the nets bringing them closer to the sleeping space; and use of stools to hold each side of the net as the net was not permanently fixed. This was clear during the group sessions. However, at an individual level, a large number of participants did not exhibit such innovations/coping strategies and reported that they do face challenges hanging these shorter LLINs at the households and do not therefore consistently hang up the LLINs every night. Strategies to correctly hang and use rectangular LLINs also emerged in the exercise – this was most important when the nets were shorter, when houses were mud-walled and when sleeping spaces were lower, including on the floor and on sofa seats.

Enabling factors for net registration and distribution: Use of the community health strategy and local administrative leaders, use of identity cards (IDs) during registration, use of the universal coverage (1 net for 2 persons in a household) approach, timing of the registration (either during planting season, election period and daytime when members are not at home) were reported to have greatly influenced registration and consequently distribution and LLIN ownership.

Effective communication channels: Multiple channels such as radio, television (TV) and community-based initiatives, public address systems, use of administration and community
elders and community health workers had a significantly wide reach during communication regarding registration and distribution.

Awareness of “Shujaa” and “Maliza Malaria” campaigns: there was a significant positive effect on knowledge and expected behavior uptake on net ownership and retention in areas where the campaigns were run through community level initiatives such as interpersonal communication by CHVs despite a relatively narrow reach. However there is need to scale up these efforts in order to maximise the benefits of such efforts.

**Recommendations**

Any decisions made around LLINs specifications need to consider the expected outcomes of issuing them and consequently use Given that this is the best strategy against malaria infection, considerations should continue to be made not only on the number of LLINs given to households but also on barriers that may influence the consistency of LLIN use. Whereas households may apply some coping strategies to work with nets which are shorter and rectangular in shape, the situation at households where this exercise is individually undertaken should be assessed and necessary support provided. Further, any decisions to change the length/height of LLINs should consider the ability to hang up these LLINs to drive consistent use.

Strategies such as financial and physical resource allocation should be put in place to mitigate challenges associated with logistical issues of registration and distribution of nets. Other strategies to be put in place include increasing the time for registration and adopting various methodologies to effectively ensure higher coverage as well as proper timing for registration. Tracer and routine community health strategies for registration of households and their members should be adopted in ensuring higher net coverage.

Communication around the mass net exercise should be extended both time-wise and geographically to cover as wide an area as possible. The period of net distribution should be planned away from political events and should occur at a time when the majority of household members are available in the household.

There is a need to increase efforts at the community level that address key behaviors (e.g. net use) by having more targeted messaging in mass media and print media (including posters) with desired behavior highlighted. In addition, there should be accurate communication on the reason for the need to present an ID during registration and picking of nets during mass distribution exercises.
INTRODUCTION

Background

The World Health Organization (WHO) recommends the sustenance of Universal coverage of nets as it believes that to be the key to addressing malaria amongst people at risk of malaria, and advocates for strategies to maintain it which include a combination of mass free net distribution and routine channels such as immunization and pre-natal services (WHO, n. d.). These strategies are a response to ensuring access and hence subsequent net use. With access, consistent net use is assured being another critical factor approach for malaria prevention. Evidence indicates that whereas these motivators may be out in place, there exist barriers which impact access to, and consistent use of Insecticide Treated Nets (ITNs). These include barriers to consistent and effective use of ITNs including size, colour, shape and texture which vary by setting. Literature shows that there are varying degrees of usage of these nets indicating that whereas some attributes may be a barrier, in other settings usage may not necessarily be affected (Koenker & Yukich, 2017; Ernst et al., 2016).

Literature has also shown that major barriers to net use such as heat, number of mosquito nets, low risk perception do not directly correlate with physical attributes of the nets. Furthermore, even if usage rates in certain settings are higher for LLINs with attributes that deviate from the standard (which in most places are rectangular, white, large-sized, polyethylene or polyester LLINs), the increased use is unlikely to offset the higher costs associated with procuring nets with non-standard attributes which are rectangular, white polyester nets (WHO, n. d.). This negates that need to procure LLINs with attributes that are costlier (e.g., nets of conical shape) and is therefore not recommended for countries in sub-Saharan Africa, unless nationally representative data clearly show that the use of LLINs with attributes increases significantly among populations at risk of malaria. Currently, the World Health Organization Pesticide Evaluation Scheme (WHOPES) has approved several LLIN-brands with different attributes including height, shape and texture. Currently funding for LLINs has one key determinant which is cost. Throughout the donor landscape, specifications and attributes of LLINs such as height, texture, shape and colour should not have a significant cost implication especially if they do not significantly impact net use. To build an evidence base to support the purchase of more costly nets, understanding of the preferences of specific population groups at risk of malaria may be warranted if standard nets are unlikely to suit the lifestyle of these groups (Koenker & Yukich, 2017), such as may be the case for nomadic populations (Noor et al, 2007).

The malaria control programme in Kenya has conducted several annual mass LLIN campaigns since 2006 to increase access and coverage of LLINs, especially in malaria-endemic and epidemic zones. These efforts have increased access to LLINs as seen in the most recent malaria indicator survey in 2015, the Kenya Malaria Indicator Survey (National Malaria Control [LLIN User Preferences Qualitative Study, 2019])
Programme, 2016). As coverage increases, establishing the actual use of available LLINs in the households has shown discrepancies and is affected by factors that are still poorly defined (Nkoka et al., 2019). Significant donor and government funding has been invested in malaria awareness, prevention, diagnosis and treatment. The main tool for malaria prevention is the long lasting insecticidal nets (LLIN) scaled up through free routine distribution to children under 1 year of age and pregnant women at public health facilities and scaled up by mass LLIN distribution campaigns to households. Distribution of LLINs through appropriate channels to achieve and maintain universal coverage (one net for every two people) is one of the strategies used in achieving this objective. Although mass net distribution is one step to increasing use of ITNs, evidence shows preference for certain net characteristics, e.g. mesh size, colour, dimensions and fabric, may have a direct impact on net use. There however exists little evidence to show whether these specific preferences may impact use, which would include hanging and using the ITNs. Yet this data is crucial in the space where decisions around net attributes are made, which may include choosing a pattern, colour, size, shape, etc. One of the currently debated questions is how users' preferences influence net use. Anecdotal observations done by the authors in several countries in East Africa including Kenya, suggest that LLIN use could be limited by a preference for locally bought, untreated nets, as they offer certain options (different colours, shapes, mesh size etc) that distributed LLINs do not. Furthermore, modification of existing nets to suit users' personal preferences, as reported in Senegal and Kenya (Grietens et al, 2013) where local tailors convert rectangular LLINs into a conical shape, are an additional indication of the potential relevance of net preference for LLIN use. A lack of clarity on the various attributes that users prefer in choice of net hampers efforts to both increase distribution and access to nets while ensuring consistent use, and changes in net attributes. There is, therefore, a need to understand the effect of these attributes on net use.

There have been recent efforts made to understand the preferences for these attributes and the potential impacts of use of LLINs in Kenya through a quantitative survey – a post mass LLIN quantitative survey was conducted in 2018 following the 2017/8 post mass distribution exercise to understand various factors in this exercise including i) Net availability at household ii) Net retention at household iii) Net use by various members of households visited iv) Communication/campaign following the mass net distribution v) Preference on net size, colour, shape. To assess preference for height, two key questions were asked to respondents in this quantitative survey including i) Between the 2014/5 net and 2017/8 net which one was longer? ii) Between the 2014/5 net and 2017/8 net, which one would you prefer? Findings from these two questions show discrepancies in awareness of the height of these nets as a third (33%) of the respondents reported the 2017/2018 nets to be longer, 19% said they were shorter than the 2014/5 ones, 7% reported them to be same height and 32% had not received the nets given in 2014/15 nets distribution exercise (Ministry of Health, 2019b). This finding indicates some confusion since the 2017/8 nets were shorter in length (180cms) while those distributed
in 2014/15 were longer in length (210 cm or longer). When asked which nets they preferred, 68% of respondents preferred the 2017/2018 nets compared to the 2014/15 nets. It is clear from these findings that there was poor awareness of the varying lengths of these two nets and consequently, no clarity on the preferred length of net. Further, even when the shorter nets or longer ones are preferred, it is not clear whether the length of nets has potential to influence use or non-use. Because of this lack of clarity, a further and deeper investigation was deemed important. It is on this premise that the current qualitative study was conducted.

Objectives of the study

The main objective of the study was to understand user preferences of nets against length/height, shape, colour and texture and its effect on use. Specifically, the study sought to qualitatively understand preferences of the various net attributes including length/height (long or short), colour (blue or white), texture (soft/polyester and hard/polyethylene), shape (conical and rectangular) and how these attributes affect net use. The study also sought to explore and understand user experiences of the process undertaken in the most recent mass net distribution exercise of 2017/18, including the process of registration and distribution of nets during the campaign and concurrent effect on net ownership and retention. The study also investigated the reach and effectiveness of the two malaria campaigns implemented, including Maliza Malaria and Shujaa campaigns.
STUDY METHODOLOGY

Study site and population

Kenya has four main malaria epidemiological zones with diversity in risk determined largely by altitude, rainfall patterns, and temperature. For this study, the sampled sites are based on the endemic and the epidemic counties that received mass nets during the 2017/8 distribution exercise.

Figure 1: Map of Kenya showing the malaria epidemiological zones
(Source: Kenya Malaria Indicator Survey (KMIS) 2015)

Endemic regions: These include areas of stable malaria with altitudes ranging from 0 to 1,300 meters around Lake Victoria in western Kenya and 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 of 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 (National Malaria Control Programme, 2016).

[LLIN User Preferences Qualitative Study, 2019]
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 favor sustained minimum temperatures around 18°C that sustain vector breeding, resulting in increased intensity of malaria transmission. The whole population is vulnerable, and case 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 Kenya Malaria Indicator Survey (KMIS) of 2015 (National Malaria Control Programme, 2016).

To understand the preference of different attributes of nets, the study was conducted in 11 sampled counties in Kenya out of the 23 which had received the most recent mass net distribution in 2017/8. These were grouped by the three epidemiological zones in Kenya as malaria transmission patterns of the disease in Kenya are influenced by rainfall, vector species, intensity of biting, and altitude.

**Study Sample**

The counties visited are in the Highland epidemic areas (Uasin Gishu and Kericho counties), the Coastal endemic regions (Kwale, Kilifi and Taita-Taveta) and the lake endemic counties (Bungoma, Vihiga, Busia, Migori, Homabay and Siaya). Mombasa and Kisumu counties were used as pilot sites to test both the tools and the data collection approach to aid in planning for the study.

**Data Collection & Approach**

The study utilized group sessions and key informant interviews. The group sessions were held with men and women separately categorizing those in endemic regions who had received or not received nets during the most recent mass net distribution of 2017/8. In addition, key informant interviews were held with community leaders, Community Health Volunteers (CHVs) and Community Health Extension Workers (CHEWs) who participated in the mass net distribution. More key informant interviews were held with National, County Malaria Control Coordinators (CMCC) and Sub County Malaria Control Coordinators (SCMCC) and other members of the county Health management teams who had information on the 2017/18 mass net process and net use.

**Study Sample**

A total of 44 group sessions were conducted with both men (11 groups) and women (33 groups). In addition, 48 KIIIs were conducted across the study sites, with CHEWs, CHVs and Village elders. All respondents selected to participate in the group sessions were approached and recruited in their villages and the sessions held in spaces or facilities such as schools, churches, halls and health facilities close to their households as well as households. The procedures and objective of the study were explained to the household members before the [LLIN User Preferences Qualitative Study, 2019]
sessions. All respondents had to be residents of the sampled community units and capable of assessing the various attributes of nets. They were also expected to give consent to participate in the study. Respondents for the KIIs had to have been directly involved in the implementation of the distribution exercise.

Four types of nets were given to each of the respondents which had a combination of the four attributes being assessed including net length/height, net shape, net texture and net colour. There were two options for height; 180 cm nets, given out during the 2017/18 mass net distribution and 210 cm or longer nets given out in the 2014/15 distribution. Two attributes for shape were assessed including conical and rectangular. Assessment for colour focused on blue and white; while for texture we had polyethylene and polyester nets.

The Evaluation Approach

The study applied three qualitative methods to evaluate the questions highlighted. These include: a Discrete Choice Experiment (DCE) approach implemented during the group sessions; Experiential Net Hanging Session implemented during the group sessions and one-on-one Key Informant Interviews with persons with information around net use and distribution of LLINs.

Discrete Choice Experiments (DCE)

Discrete choice experiments (DCEs) is a stated preference method that uses a survey to systematically quantify individuals’ preferences of a product/service. The method is used to understand the characteristics (termed attributes) liked by consumers, how they balance these attributes, and the relative importance of each attribute in their decision to consume the product. DCEs are underpinned by 2 key economic theories: Random Utility Theory (RUT) and Lancaster’s Theory. The 2 theories combined suggest that DCE respondents choose the option from each choice-set which provides them with the most satisfaction or “utility.” The method has been used to understand people’s preferences in a variety of settings, often when it is challenging to observe consumers making choices in real markets. Although heavily quantitative in nature, some studies have shown the importance of qualitative research methods in the design of DCE surveys. This thus influenced the approach adopted in the current study which kind of employed both a quantitative and a qualitative element – participants were asked to choose attributes they most like, rank them in order of priority and afterwards reasons for these choices explored in a discussion. This study employed the DCE approach as it has potential to help understand users’ preference of nets, and reasons for their choices.

Ranking of attributes

Part of the assessment of the attributes was a ranking exercise which involved the group session participants placing in order (partial order or complete order) the set of attributes and
hence the alternative nets according to which they consider to be the most appropriate to non-appropriate for acquisition and use.

**Experiential net hanging**

The experiential net hanging session was a participatory activity where members of the group sessions selected two nets that had differing attributes in terms of length and shape. They then proceeded to a nearby household belonging to one of the group discussants to conduct an actual in-household net hanging session. These sessions were selected as a method of assessment as they had potential to let researchers observe whether respondents could work with nets of varying length and shape. It was crucial to observe any difficulties as well as innovations undertaken. Consent to undertake the sessions was sought from members of the groups. The sleeping spaces available in the household were then utilized for the sessions. The selection of a sleeping space depended on culture and for some households, the participants picked the sleeping space that is usually used by the children, and/ or using the actual spaces used for sleeping by members of the household visited. Members of the group session picked amongst themselves the individual/s to hang the net in the consented household and space whilst the rest observed the exercise, giving ideas or suggestions to assist the individual/s to hang the nets given any challenges that the individual/s encountered. Afterwards a discussion of the process was undertaken, moderated by a researcher. Several things were discussed, including the views on how the session was conducted, any challenges experienced, strategies employed and challenges experienced hanging nets of varying lengths/heights and shape at their households.

**Training of Research Assistants**

A training to orient the eight Research Assistants (RAs) who participated in the study was conducted in Nairobi prior to being deployed to the counties. The research assistants were selected based on having at least five years’ experience in collecting qualitative data in the specific settings where they were assigned. The training conducted in June 2019 was implemented by Population Services Kenya (PS Kenya)’s research and malaria teams working together with members of the National Malaria Control Program (NMCP).

The research assistants were trained on the data collection techniques and procedures and ethics in qualitative research. The training had both the theoretical and practical/hands-on sessions. Emphasis was made on the practical sessions given that the DCE and experiential sessions employed in the study are uncommon methods of qualitative data gathering, hence the need for extra effort during training to ensure that the research assistants clearly understood the methods and were comfortable in implementing them. The following topics were covered at training: An overview of PS Kenya and NMCP’s work on malaria in Kenya; purpose of the evaluation; understanding the data collection tools; interviewing techniques and how to minimize communication barriers; code of conduct and ethical issues to observe

[LLIN User Preferences Qualitative Study, 2019]
during the field work; sampling techniques—selection and identification of participants; administering the tools; pre-testing and standardization of the tools; translating and transcribing the data, and reporting the findings.

**Ethical Considerations**

Ethical approval for this study was sought from African Medical Research Foundation’s Ethical and Scientific Review Committee (AMREF ESRC) prior to data collection (#AMREF-ESRC P401/2017). In addition, research assistants sought consent from participants prior to conducting the sessions and interviews. Each participant was carefully taken through the content of the letter of consent and informed about the purpose and procedure of the study so they could understand the nature of the research and any likely impact it may have on them. They were further made fully aware of their rights to withdraw from the research without fear of any consequences and assured of their voluntariness to participate in the study.

Participants were also assured of the confidentiality of the data they would provide. During the interviews, the moderators sought participant’s consent to record the interview, lead the discussion; while the note taker took short-hand notes and ensured that the whole discussion was recorded using an audio-recorder. In instances where verbal quotes are used in this report, these have been anonymized in order to protect the identity of study participants.

**Data Processing and Analysis**

During data collection, note-takers took notes in a thematic analysis template to allow for rapid synthesis of data. The data from the field was entered in the computer and cleaned before being analyzed. The data from the DCE approach was keyed into excel and then analyzed using frequencies and proportions and is presented in form of graphs. Qualitative data was categorized into the key patterns and themes, coded and cleaned before being analyzed and interpreted. These themes were used as a guide in the preparation of the evaluation report. It was synthesized and forms the findings section of the report. In some instances, some of this data is presented in some sections of this report, as quotes to emphasize the insights articulated.
STUDY FINDINGS

Sample characteristics

The qualitative study targeted community members (men and women) through group sessions. Further, KIIIs with personnel directly involved in the implementation of the 2017/2018 mass net distribution exercise and those regularly involved in malaria implementation efforts at various levels interviewed. This distribution of the sample is highlighted in Table 1 and 2.

Table 1: A Sample Distribution of the Group Sessions

<table>
<thead>
<tr>
<th>County</th>
<th>Male Group Sessions</th>
<th>Female Group Sessions</th>
<th>Total Group Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highland Epidemic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usain Gishu</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Kericho</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Coast Endemic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kilifi</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Kwale</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Taita Taveta</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Lake Endemic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bungoma</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Busia</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Homabay</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Migori</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Siaya</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Vihiga</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11</td>
<td>33</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 2: A Sample Distribution of the KII

<table>
<thead>
<tr>
<th>Audience</th>
<th>Coast Endemic</th>
<th>Lake Endemic</th>
<th>Highland Epidemic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-County Malaria Control Coordinator (SCMCC)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>County Malaria Control Coordinator (CMCC)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Community Health Extension Worker (CHEW)</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>Community Health Volunteer (CHV)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td>Public Health Officer (PHO)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Village Elder</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Assistant Chief</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Partners (Uzima)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

[LLIN User Preferences Qualitative Study, 2019]
Preference of LLINs given the various attributes

Available evidence indicates that bed net users often have preferences for shape, colour, size, and other attributes, although it is unclear whether these preferences are strong enough to have any significant effect on net use, and whether countries and donors should invest in more expensive attributes to maximize LLIN/ITN use (Koenker & Yukich, 2017). This section provides an analysis of attributes preferred by those responding in this study. The section further shows how these attributes are ranked in order of priority showing the critical ones that have potential to influence acquisition and use.

Respondents were presented with nets with different attributes. There were four main attributes assessed namely: net length/height, net shape, net texture and net colour. There were two options for height, 180 cm (short) nets and 210 cm or longer (long) nets. The two attributes for shape were conical and rectangular. The options given for colours were blue and white; while for texture we had polyethylene (hard) and polyester nets (soft). They were asked to indicate the attributes they prefer and rank them in order of preference.

Overall, the net attributes that participants preferred included long (210 cm or longer), conical-shaped, blue colour and smooth/polyester texture.

Length/Height

Almost all the participants in the sessions preferred the longer net (210 cm) compared to the shorter one. In addition, net height was ranked as the highest attribute to consider for acquiring and using a net, except in the highland epidemic counties where this attribute had a lower rating (74%) compared to the other regions with a proportion of above 80%. Height was the most prominent attribute preferred by the respondents and a majority indicated that the longer nets fit their sleeping spaces better, hence the preference. There wasn’t a significant difference amongst the men and the women either, as majority of respondents of both gender preferred the longer nets. Apart from fitting sleeping space better, longer nets were preferred as they do not cling to the body during the night unlike the shorter ones which consequently expose the user to mosquitoes bites even when sleeping under the net. They concluded therefore that longer nets are more comfortable and spacious to sleep in.

The structure of their households and sleeping spaces was a factor considered when choosing their preferred height. In the coastal endemic area, the giriama (“mkishu”) beds do not allow hanging so users prefer a longer net. Their preference for height had a correlation to shape since most of the participants preferred the conical shaped nets because they viewed them to be longer.

“Height is important because it allows the net to reach the ends on any shape and size of bed and also on the ground. It also allows for better tucking in especially for the children sleeping on the floor” Female FGD, Busia.

[LLIN User Preferences Qualitative Study, 2019]
Most of the house structures where hanging sessions were conducted were primarily mud-walled, some were grass thatched although a majority had iron sheet-roofing. The shape of these houses was mainly rectangular and square in Highland, lake endemic regions as well as in some areas in the coastal region. The beams of these houses are diagonal, with only one bar running across. Some of the houses had multiple planks of wood running across giving space for hanging nets. A few had ceilings, which made hanging easier. During the net hanging sessions, the height of the nets proved to be a major factor, especially in households with sleeping spaces on the floor as well as those without a ceiling. For some households, it was clear that nets currently being used do not fit their sleeping spaces. We observed opened nets hanging from the roof but not extending all the way down to the lower edge of the mattresses on the floor. The longer nets on the other hand fit better when used during these hanging sessions.

Almost all participants in the sessions preferred and appreciated the longer net as this was easier to use given that they properly fit the sleeping space ensuring they are well tucked in, including sleeping spaces on the floor. The length of nets and the inability to fit the sleeping space was mentioned as the major shortcoming of the 2017/18 mass distributed nets since they were shorter than those given out in 2014/15.

**Strategies employed when using the shorter nets:** Despite the challenges highlighted, participants employed a number of strategies to fit the shorter nets on the various sleeping spaces available, including those on the floor. [Error! Reference source not found.](#) shows some of the innovations that participants employed when hanging short nets during the net hanging sessions.

![Figure 2: Strategies employed in hanging short nets](image)

Some strategies observed and heard during these sessions included the use of extended ropes with the provision of the loops on the nets, the use of cloth hanging lines to fit the nets

[LLIN User Preferences Qualitative Study, 2019]
by increasing the length, the use of stools, sticks and seats as holders for the nets instead of tying the nets on the walls and tying only one side of the net on the wall, especially rectangular shorter nets thereby letting the untied side fall onto the sleeping space on the floor. The use of additional tools/equipment including hammers, stones and nails to provide support for tying on the walls was also observed during the net hanging sessions.

Despite these innovations стратегies, it was clear that this was mainly possible since the sessions were conducted as a group, making it easy to share ideas of the strategies to use. Asked about strategies they employ at their households, a number of participants did not use such innovation to hang short nets.

Shape
Participants in these sessions were asked to indicate the shape of net they preferred between the rectangular and conical shaped nets. A majority (79%) reported preferring the conical nets with almost all the female respondents across endemicity preferring the conical-shaped ones. There were similar findings amongst male participants where a majority preferred the conical nets with a slight variation in the coast endemic sites where some men preferred the rectangular nets.

Several reasons were mentioned for preferring the conical nets key being that it is easy to hang since the conical net only requires one point to do this. Another selling point for a conical-shaped net is that it is easy to hang over any sleeping space and even easier to unhang in the morning if needed to.

“A conical net is more attractive compared to the rectangular when hang or when folded in the morning” Female FGD, Siaya.

“It (the conical net) is longer than the rectangular net” Male FGD, Kwale.

The varying household types and structures, including the various materials of the walls and roofs were also determining factors in choosing the conical nets. The mud walled houses do not have sufficient and permanent options to drive in nails to hold multiple pegs or nails as is the case when using rectangular shaped nets. During the experiential net hanging sessions, this was evident, and participants cited challenges in approaches that they would use to hang the rectangular nets. The conical nets seemed much easier to hang during these sessions as can be seen in Error! Reference source not found. It emerged that rectangular nets were harder to hang especially for those living in mud-walled or concrete-walled houses. This is because in the absence of any other support, including [LLIN User Preferences Qualitative Study, 2019]
beams on the ceiling, the ceiling itself and a bed frame, household members often need to drill nails into the walls to be able to hang nets. The challenge arises when the nails keep falling off either because the concrete is too hard to hold the nail or the fact that the mud wall is too soft to keep the nail intact. This challenge often requires repeat efforts to keep the nail firmly attached and if the net is shorter or rectangular, constant tugging to fit on a sleeping space easily causes the nails to fall off from the wall. It emerged further that those hanging the nets sometimes gave up on putting the net up, especially when tired or in a hurry to get to sleep.

**Strategies employed when using the rectangular nets:**It was noted during the net hanging sessions that the community was able to give each other coping strategies that they would use to overcome the challenges of hanging the rectangular nets in different houses and for different sleeping spaces. These strategies were evidently from experience with the current rectangular nets in their households received from the 2017/8 mass net distribution. These strategies included use of nails and elongating ropes in most households across the different counties, some household members like in Bungoma County used sticks and cans to act as posts for the bed nets to hang on among other strategies of similar efforts. This was because of the extensive community IPC work that had been conducted in the community by community health care workers. A female participant in one of the groups intimated:

“The CHVs showed us how to hang a net in our households, in this community we know what to do to prevent malaria, we know how to hang a net” Female FGD, Bungoma.

Like strategies employed whilst trying to hang shorter nets, most of those employed whilst trying to work with rectangular shaped nets, which are shorter, were consolidated as a group. This indicated that it was easier to do this as members of the group shared ideas on what to do to hang the net. Individually however, participants highlighted how challenging this can sometimes be. Some participants, especially the female participants, stated that they would at times end up not hanging the nets due to fatigue and the process involved in getting the net up. This presents a challenge to malaria programming as ownership of a net does not translate into consistent use and thereby malaria prevention. The structure of the house and difficulties in hanging the rectangular net seem to influence the choice of shape of net. The other reasons mentioned include cleanliness and attractiveness of the conical-shaped net when hang and when folded up after use. The smaller ring or circumference allows it to fit in their small houses and rooms.

Despite the overwhelming preference for conical-shaped nets, some respondents, especially those using beds in their houses, preferred the rectangular ones. women and men who preferred the rectangular net mentioned that it fits well on the bed since it has corners that fit well in the bed and it is easy to hang. They mentioned that the shape enables them to easily tuck it into the bed. This avoids any excess pulling that sometimes causes tears on the net. An element of net care also came up in Bungoma, indicating the positive impact of messaging by
the community health volunteers (CHVs) given during net hanging outreaches. This is one way that the community-based strategies could increase net use.

Other challenges were also experienced during the participatory net hanging sessions. For instance, men in Bungoma County confused the width and the length, were therefore unable to fit the net on the bed and began criticizing it for its shortness. They also mentioned that they are not used to hanging nets in their households as they see that it is women’s work.

Although the preference for the conical net was evident, it was noted that with the challenges and the wide availability of the rectangular nets, since as this is what most of the participants had in possession within their households, they would still use them. They would however need to employ some strategies to enable most men, especially those unmarried and/or widowed to use the nets, given that most do not usually go through the laborious process of hanging up nets before sleeping. For those (both men and women) that had to fold up the net, when sleeping space is used for other purposes, fatigue was noted as the biggest barrier to consistent net use.

Texture
Two textures of LLINs, polyester (soft) and a polyethylene (rough), were provided to the participants in this study to assess which they prefer. A majority preferred the polyester nets to the polyethylene ones as they were softer. They preferred the softer/polyester net because of ease in washing, tucking in and folding or tying in up after use. They also mentioned that the softer ones had smaller holes and would therefore not allow mosquitoes to go through unlike the bigger holes in the rougher net. Various other issues regarding net care were highlighted as the drivers for this preference, including the fact that it shrinks less after washing, lasts longer and does not easily catch fire. The one drawback for the polyester net mentioned was that it tears easily when draped/hung over a rough surface of a bed.

“The soft net is comfortable to the skin even when washing it is not rough to the hands”
Female FGD, Vihiga.

“I like the softer one, because of its texture, a rough net will be rough on your skin I prefer the soft net.” Male FGD, Kericho.

Some participants, especially men, were indifferent to specific texture. They had no strong preference for texture neither did they consider it important enough to affect use.

“You just take any net because the use of a net is to prevent mosquitoes and any texture can do it” Male FGD, Migori.

Colour
Colour emerged as the least considered attribute during the ranking of attributes that would influence their use. The two-colour options provided were white and blue, and the findings show a specific preference for the blue coloured nets across endemicity. Most of the women [LLIN User Preferences Qualitative Study, 2019]
preferred the blue nets due to various reasons and cited both structural and behavioral issues to support their choice. Most mentioned structural issues such as the arrangement of their households and sleeping spaces especially in the rural areas. Reasons such as their house spaces being used for other tasks including cooking and sleeping and as such, they preferred the blue nets because they do not show dirt easily. This is because cooking in the households produces soot and causes white nets to get dirty faster. Blue colour to majority of them also equates to fewer washes and thus keeps the efficacy of the net for longer. Preference for blue over white colours was also influenced by the perception that it is calmer to sleep under a darker et compared to a lighter coloured one. Some participants were however indifferent to colour while others just liked the colour.

“Colour is not very important because it does not affect if mosquitoes will get to you, you can also wash if it gets dirty.” Female FGD, Vihiga.

“I prefer the blue net because I love the colour” Female FGD, Kilifi.

In some instances, preference for colour was based on cultural beliefs, as was the case in the Coastal region where most participants, both in the group sessions, and in the one-on-one KIIs viewed the white net as resembling the “Sanda” (shroud) used to wrap dead bodies during burials in the coastal/ Muslim areas, thus preffering nets to come in blue colour instead.

“The white nets look like the net used on a dead body” Male FGD, Taita-Taveta.

In some instances, male participants preferred the white colour mainly because it is easier to see the mosquitoes, dirt or any foreign material (especially bedbugs). The other reason was that the white nets depict cleanliness in a household thus making it more attractive. They expressed concerns over having dirty nets in the household and related this to state of health or socio-economic status of a household. Thus, they preferred white nets since blue colour hides the dirt.

Overall, during the net hanging sessions, there was a distinction between the male and female participants during the net hanging sessions as majority of the men across board faced more challenges in hanging the nets as they did not seem familiar with them, evidence of them not being actively engaged in net hanging in their households. They struggled not only with hanging up the nets but even just identifying the side of net to hang. “Hii ni kazi ya kina mama (this is the woman’s role)” was a common phrase throughout the male sessions.

**Ranking of nets attributes**

Those participating in the DCE were asked to rank the various net attributes in the order in which they prefer, considering attributes that would most influence acquisition and use. These attributes included Height/Length, Shape, Colour and Texture. A majority ranked height as their priority attribute to consider in selection of a net or an attribute likely to most
influence use (Figure 5). Ranking however varied slightly by region, as height came second in the highland epidemic regions, for example.

![Chart showing net attribute rankings](image)

**Figure 4: Ranking of net attributes**

A majority (82%) of the population across all areas assessed regard height as the most critical attribute of a net that is likely to influence use. Shape follows at 79%, texture at 74% and colour at 66% percent. Error! Reference source not found. indicates this ranking by region/endemicity. In Highland endemic region, shape is given most priority, followed by height, texture and colour in that order. The situation is different in the Lake endemic region where height is given the most priority, followed by texture, shape and colour. In the Coast endemic region, shape and height are prioritized, followed by texture and colour in that order.
Figure 5: Ranking of net attributes by region/endemicity

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Highland Epidemic</th>
<th>Lake Endemic</th>
<th>Coast Endemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>74%</td>
<td>86%</td>
<td>72%</td>
</tr>
<tr>
<td>Texture</td>
<td>72%</td>
<td>74%</td>
<td>74%</td>
</tr>
<tr>
<td>Shape</td>
<td>86%</td>
<td>73%</td>
<td>82%</td>
</tr>
<tr>
<td>Color</td>
<td>68%</td>
<td>67%</td>
<td>63%</td>
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</table>
Net Access, Ownership & Retention

The Registration process for the 2017/18 mass Net Distribution of LLINs

Use of LLINs is a key component of vector control as well as a key preventive intervention in malaria control. It will continue to be a major focus in the Kenya Malaria Strategy 2019-2023 (Ministry of Health, 2019a). LLINs are distributed in endemic and epidemic-prone areas through mass campaigns every 3 years; through ante-natal clinic (ANC) for pregnant women and child welfare clinics for children under 1 year. Access to an LLIN is a pre-cursor to ownership and directly affects use. Men, women and key informants interviewed reported a wide reach of social mobilization efforts for the registration of households to receive the mass nets. Use of the community health strategy and other administrative and local leaders was hailed as a great platform for the registration and distribution of nets. The use of CHVs, village elders, use of IDs during registration, universal coverage (1 net for 2 persons in a household), timing of the registration (either during planting season, election period and daytime when members are not at home) were some of the factors that influenced registration and hence net distribution and ownership.

Approaches used during the registration process

Use of CHVs and community leaders. During the registration process, CHVs and village elders would go from household to household registering members. Important information collected included number of household members to determine the number of nets to give to a household. They collected other types of information as well, including the household head’s name, their ID number and the number of children below 5 years.

“The CHV and village elder came to my house and took the number of people in the house. They also asked if we use or sleep under a net. They told us that they would give us a net for every two children.” Female FGD, Busia.

“I used to go around with a pamphlet where I write age, name, telephone number, the HH signature, and household ID number for the registration process.” CHV KII, Bungoma.

The use of community health volunteers was the major avenue of registration for the households. Specifically, the use of community based structures in tandem with the community health strategy served as a vehicle that aided the registration of households.

“The CHV was in charge of registering families, she would ask for the number of children in the household, net availability, and the number of sleeping spaces.” Female FGD, Siaya.
“Since the CHVs know their households, they knew where to get them, even if they had gone out in the fields during the day, they would wait for them until evening to register them” CMCC KII, Kilifi.

Village elders and other administrative officers also took part in the registration of households. In most counties, they played a key role during the mobilization and registration process within the community.

“The village elder came to our homestead and requested to meet the head who then oversaw the entire registration process and then went to receive the net.” Female FGD, Busia.

"When the village elder came with the CHV, they explained why they had come and then asked for my identity card and also asked how many people were in my household, they also told me how many nets I would get and why". Female FGD, Kwale.

The use of CHVs and village elders was an efficient approach which worked to ensure coverage of most households. There were however instances where the approach did not go seamless, leading to some households missing nets. Indeed, some households went unregistered in some areas. Further, in some areas in the coastal region, a few households were not registered using appropriate registration tools. In such cases, registration was done in pencil and when they presented to pick the nets, these names were found to be missing, thus they did not receive nets as they had expected.

“Some people CHVs did not go door to door instead they sat in one household they registered the names of other households while there.” Female FGD, Taita-Taveta.

“In some places, we do not have full coverage or functional community units and thus there is lack of CHV coverage, if we get support, next time all houses can be registered” CMCC KII, Kilifi

“They should not repeat what they did the last time, they wrote our names in pencil on the list, and when some households went to collect the nets in the schools, they were told their names are not there and so they did not get the nets, so, they do not have nets to use” Female FGD, Kwale.

Use of Identification cards (IDs). The use of ID cards for registration elicited mainly positive but in a few cases, negative responses across endemicity and amongst both male and female participants. A majority mentioned this to be a good approach as it guarded against any bias or favoritism and portrayed transparency in ensuring that all households were registered to receive nets. On the other hand, the fact that only those with ID cards could be registered to receive nets was a barrier to registration especially in cases where the head of household did not have an ID card. This was in turn viewed as a big obstacle in this process.

[LLIN User Preferences Qualitative Study, 2019]
“The CHV and village elder registered us. They only asked for ID and the number of household members” Male FGD, Busia.

“I was visited by a CHVs, she explained that the are registering households in preparation for mass net distribution and that she needed to see the ID of household head and know the number of people live in the household which I gave, she told me that I should come with the ID card on the day of distribution” Female FGD, Taita-Taveta.

“Those without ID cards were not considered in the process because they could not get the net without identification or verification” Male FGD, Siaya.

**Use of the Universal Coverage approach.** Universal coverage which entails each household receiving one net for two people, was the criteria used during community registration and consequently provision of LLINs to members of the target communities. Some households were informed beforehand the number of nets they should expect based on the number of household members registered. This approach was however criticized during this data collection. The complaints emerged from the various regions visited during the study and from both gender. They felt that other factors besides universal coverage such as culture, age, gender be considered, because these play a significant role in the number of sleeping spaces that would require a net, which in many cases is more than the allocated number of nets.

“I disliked the consideration of 1 net for 2 people because not everyone can share a bed due to difference in sex and age”. Female FGD, Kwale.

“Mosquitoes are not a respecter of persons so everyone should get a net and sleep under one, not two people, I cannot share a net with my children” Male FGD, Siaya.

**Timing of the exercise:** Another challenge expressed around registration process was the timing. The net registration exercise leading to the 2017/18 distribution exercise occurred during the election period, and it was a challenge to get most households at their homes. The politically sensitive nature of elections led to some people boycotting the registration because IDs were being used. Households in some areas did not take part in the registration process as they felt that the exercise had a political inclination towards the government of the day yet they were in an opposition area.

“In some wards here, there were some villages that stopped both the registration and the distribution, even going ahead to stop the lorries transporting the nets from entering their wards. You know, this is an opposition area and the community did not want to be associated with the government, especially because they were registering with the ID cards”. Assistant Chief KII, Kwale.
For others, timing was a challenge as either it was during the planting season and they had moved to the farming lands, or it was during the school holiday period and thus households had temporarily travelled for the festivities. Timing of day when the exercise was conducted was also a challenge as registration was done during the day when some households were out in the field/ or at work and thus they/ their households missed the registration and subsequently missed to receive nets during distribution.

“The coverage of the CHVs was not sufficient because of time and resources, they only had one week to cover all the villages and the number of CHVs allocated from the allowances provided were few, so they did not manage to cover all the households within that week” Assistant Chief KII, Homabay.

Communication ahead of registration: The main channel of communication on registration was door to door campaigns by the CHVs. Others included radio, announcements on TV and radio, churches, public address systems, chief’s barazas and funerals. A combination of these approaches ensured that this information reached most of the community members.

“The reach was high because they used community gatherings such as funerals and churches to get the people.” Female FGD, Kericho.

“I would say that the reach was 75 to 85 percent because word of mouth was used to ensure people received the registration information.” Male FGD, Homabay.

A few setbacks were highlighted in the communication approach, including the fact that potential recipients were not given full information about the process itself, the number of nets to be given out etc. Participants were also not told the type or the attributes of nets to expect. They were, however, told that they would get one net for every two people in the household.

“They used to count everyone in the house then tell us that they would group us into two for every net during distribution.” Male FGD, Bungoma.

Gaps in the approaches used during registration

Findings of this study suggest that whereas most of the approaches employed during the registration process contributed greatly to a successful exercise, there are a few gaps that should be considered during the planning phase, especially regarding sensitization and mobilization. These include proper timing, communication on why IDs are required, clarification during registration of misconceptions about political affiliations and unbiased selection of CHVs.
The Distribution process for the 2017/18 mass Net Distribution of LLINs

Approaches used during distribution

A majority of the net distribution points were public primary schools and dispensaries or community health centers. The secondary distribution points were the local administration offices, including the sub-Count office and assistant chiefs’ camps. In some instances, village elders and CHVs personally delivered the nets to those unable to present to the distribution points to collect their nets, including the sick, the elderly, and the disabled.

“They used to alternate the points of collection between the public school and dispensary depending on accessibility at the time of distribution.” Female FGD, Migori.

At the community level, the community health extension workers (CHEWs), under the guidance of the local administration, assistant chief and chief, arranged for distribution centers then advised the County Malaria Control Coordinators (CMCCs) and Sub-County Malaria Control Coordinators (SCMCCs) who took up the logistics, arranging for nets to be warehoused and transported to the various distribution points at the scheduled times.

“I was involved in setting up designated distribution centers and slated dates for the distribution exercises within the county.” CHEW KII, Busia.

“I was a community educator at chief’s barazas educating village elders and CHVs on distribution location and timing.” CHV KII, Bungoma.

Some of the community leaders took initiatives to ensure that specific individuals or households that had been left out either during the registration or the distribution received nets.

“In addition to maintaining law and order, I also helped in distributing nets for the disabled and sick in their homes.” Village Elder KII, Siaya.

Challenges with approaches used

Though this worked in most of the counties, there were some challenges experienced with mass net communication both at the national and county levels. Some county implementers mentioned communication breakdown and a lack of timely feedback during the registration and net distribution process.

Other challenges included insufficient staff, lack of material for registration, insufficient allocated financial resources in communities especially for sparsely populated and vast counties, limited time given for the registration process, and accessibility issues for unavailable households. These challenges led to a lower coverage or reach of communication.
and therefore lower willingness amongst community members to register for and receive nets being given out.

“The officers were not observant during registration because after that it was hard to take note of the appropriate numbers of nets to give at distribution.” Female FGD, Siaya.

“There was also lack of enough facilitation for the registration team, including the health promotions team and CHVs.” HPO KII, Bungoma.

Such challenges were a deterring factor to net access leading to non-use of nets.

“They [registration personnel] came at home and found out that I had briefly left. They did not come back.” Female FGD, Siaya.

“The process was done during election period. The ID number factor meant that many feared registering.” Male FGD, Busia.

The administration working in synergy with the community health strategy made net distribution possible though they faced a few challenges. A major challenge on distribution was shortage in net supply. Other challenges included missing names in the distribution registry and nets not being given for people without ID cards. Dishonesty in listing of the number of people in a household was observed and it affected the nets received by households. It emerged that community members were sometimes untruthful about the number of people in their houses and expected to receive more nets than were required, a situation that however was quashed since, after registration, a confirmation of number of people in each household was done by the village elders who are familiar with most of the households and their sizes.

“It was unfair that we were there the whole day only to get very few nets than what the village elders and the CHV had told us.” Female FGD, Kwale.

“There are those who were using their friend’s ID cards, who then would end up missing out on net distribution.” (Women FGD, Siaya).

Favoritism where village elders and CHVs gave people they knew more nets thus likely leading to a shortage of nets was also mentioned as a setback in the process employed.

The use of the Universal Coverage approach has been criticized since sometime, given the culture and thus sleeping arrangements, the nets given to a household are inadequate, thus:

“The use of ID cards would hinder distribution. The UC policy was also a challenge to some extent because there are some cases that do not fit into the model especially elderly couples and contrasting gender and age combinations.” CHEW KII, Busia.

[LLIN User Preferences Qualitative Study, 2019]
Supervision during Distribution

There were different levels of coordination and varying roles for the individuals taking part in the distribution exercise. The County Malaria Coordinators took charge of the entire coordination process for their counties and acted as the general supervisors. The Sub-county malaria control coordinators (SCMCC) supervised net receipt, warehousing, and dispatch to various wards whilst CHEWs of PHOs supervised the process at the ward level. The CHEWs and PHOs oversaw the entire distribution process at the ward level. At the village-level, they worked with CHVs for coordination and with village elders working under the guidance of the assistant chiefs to advise on the nets required for each household. The village elders oversaw verifying details of community members in the registers against the IDs as well as maintaining law and order. The CHVs were then responsible for confirming receipt of nets to the households concerning the Universal Net Coverage (UNC) policy.

“I was in charge of planning, supervision, and educating CHVs strategies to ensure all people registered received their nets. I also worked with the MOH office and local administration to conduct this exercise.” SCMCC KII, Busia.

“My role was to receive nets and store them at a warehouse, organize for security distribution, and participant recruitment for distribution process at the county level to the grassroots.” CMCC KII, Migori.

“I went for training then educated and supervised CHVs and Village elders to allow them to do the distribution. I also supervised the entire distribution process and helped tackled any issues […] such as shortage of nets.” CHEW KII, Siaya.

“During distribution, I was involved in supervising the lines within the distribution center at the facility.” Village Elder KII, Bungoma.

Drivers to Net Use

The primary facilitator to net use as mentioned by almost all the respondents (as well as in literature) is accessed. This is made possible through routine and mass net distribution in both the endemic and epidemic regions of Kenya. Women receive nets when pregnant and when visiting dispensaries for ANC. The government then runs the mass net distribution exercise on a regular basis to ensure sustainability in ownership. Apart from access, other facilitators include women being as drivers of use; malaria prevalence vis-à-vis the cost of treatment, CHV-led education on the importance of net ownership, use, and retention; and net use as a routine practice.

The preference of a long, conical, blue and soft/polyester nets has an effect on use and has in some instances left members of the households, especially children and male members of the community vulnerable to malaria infection. Findings have indicated that amongst the four

[LLIN User Preferences Qualitative Study, 2019]
attributes of a net, the height has the most significant effect on net use. Even though community members have come up with innovative ways of using short nets, the shorter nets still pose a significant challenge for use. A majority try to make do with what they receive as they depend on the nets given during the mass net distribution exercises.

Some of the associated barriers to ownership and retention include ignorance and side effects of the chemical component used in nets for mosquito prevention. The bedbug menace is a major barrier in the western and Nyanza regions with most participants confessing to stopping use after finding out that the chemicals in nets attract bedbugs. Other barriers include alternative use, social-economic status (affecting willingness to buy and pay), type of sleeping spaces, and availability of excess nets through mass net distribution and routine distribution. Some of these challenges have led to nets either being disposed of or being put to alternative uses.

“We as men tend to sell off extra mosquito nets in exchange for alcohol.” Male FGD, Bungoma.

“Sometimes we are very ignorant and know that nets are easily and readily available for we give them other uses such as fencing vegetable gardens and restraining chicken.” Female FGD, Busia.

**Disposal Mechanisms and Alternative Uses of ITNs**

A majority of participants in this study lacked knowledge of proper disposal of ITNs. Some of the mechanisms for disposal mentioned include burning, burying, storing, and alternatively used as bedding, bathing sponges, sporting material. Mending of nets did not emerge as a priority for the sampled communities as majority reported access to nets from both past and current mass and routine net distribution exercises hence a surplus that they use when the current ones get torn, instead of repairing them.

“There is lack of awareness of a proper disposal process. There is currently no strategy in place to collect, store and dispose of the nets. I would suggest open burning as a mechanism to curbs.” PHO KII, Busia.

“The majority do not know how to dispose of nets especially the general population. The technocrats know that burning in an incinerator and burying six feet under helps in the disposal process.” Malaria Manager KII, PS Kenya.

“When I am tired of mending a torn net I will just throw them away.” Female FGD, Migori.

“Some of the disposal processes used here include burying, burning, and throwing in the pit latrine.” Male FGD, Siaya.

[LLIN User Preferences Qualitative Study, 2019]
“The best thing when disposing of old nets is just to burn them.” Male FGD, Kericho.

The majority of nets used for alternative exercises were those that are torn and old. Some of the mentioned alternative uses reported include use as bathing sponges, fencing vegetable gardens, ropes for restraining animals, and bathroom walls. The rougher textured net has been used by those around the lake as a fishing net. Border-communities also export and sell surplus nets to neighboring countries.

“There are those who sell nets to those with more people in the household in order to buy food.” Female FGD, Busia.

“There are some people who use old nets to dry grain like maize.” Male FGD, Homabay.

**Willingness to Buy and/or Pay for LLINs**

Across endemicity, there is a slight willingness to purchase an LLIN but it is only open for those with stable sources of incomes and also depends on the cost of the said net. A key barrier to willingness to buy and or pay for an ITN is the awareness that free nets are available either through mass or routine net distribution.

“The majority have free nets and take is as a government’s responsibility to offer these nets. A few would be willing to purchase because they know the importance of a mosquito net in preventing against malaria. Size and quality remain a major factor in influencing the willingness to buy.” CMCC KII, Siaya.

“There is lack of willingness to buy a mosquito net mainly because of the current economic status. Purchasing would only occur if it is a requirement during school admission. Net preference will involve also the beauty of the net.” CMCC KII, Busia.

The recognition of the importance of net use in malaria prevention is a key driver for willingness to purchase nets. This is also reflective in the willingness of some to purchase tailor-made nets due to preferences such as height, shape, colour and texture.

Some of the other factors affecting willingness to buy and pay (WTB/P) include net use as a requirement during school admission, preference for attractive nets and size of sleeping space. Some of the respondents reported willingness to purchase nets due to a higher source of income within the community.

“Only those with a stable source of income will be willing to buy such a net.” PHO KII, Busia.

[LLIN User Preferences Qualitative Study, 2019]
“The community cannot afford nets that come with a high price, like five hundred shillings. Those who can afford such nets have money.” Female, Kericho.

“There is an overall willingness to purchase nets in case of unavailability because of the fear of malaria and I fear mosquito bites others are used to sleeping under a net.” Female FGD, Bungoma.

“Willingness to pay largely depends on the household’s social economic status. People who buy would prefer a net that fits their needs such as a longer net that fits their household’s set ups as well as LLINs because they are treated.” Malaria Manager KII, PS Kenya.

Communication during the 2017/18 mass LLINs distribution exercise

Communication for distribution
The primary sensitization process was done by CHVs and village elders. They mainly used interpersonal communication through door to door communication and chief’s barazas. Another sensitization method was the public address systems in the community with the tagline “Pata neti” by PHOs. Peer to peer approaches using word of mouth also played a significant role in ensuring that communication on distribution time and place of the nets reached the community members. Some community members were sensitized by their neighbors. Aside from use of the public address systems, local radio stations were also used for communication on net distribution time and place.

“I collected my net at the dispensary. The time and place for distribution was communicated to me by the CHV through the village elder.” Female FGD, Bungoma.

“There was a vehicle going around telling the community on registration and distribution. There was a local radio station that was also used to advertise the same talking about where and when to find the nets within different areas.” CHEW KII, Busia.

“The assistant chief announced that the nets had come then we were told to come and collect them.” Female FGD, Kericho.

Assessment of ongoing Malaria SBCC campaigns
One of the issues this study sought to investigate was the effectiveness of the two social behavior change strategies employed as malaria intervention approaches. The two campaigns assessed were; the “Maliza malaria” and the “Shujaa” campaigns implemented by NMCP and PS Kenya respectively for 3-6 months prior to the study. The Shujaa campaign faired better in the three counties where it was heavily implemented but there was notable low awareness of both campaigns in most counties.

[LLIN User Preferences Qualitative Study, 2019]
**Shujaa campaign**

The study found modest awareness of “Shujaa Campaign” in the three counties involved in the Shujaa community challenge that is, Bungoma, Migori, and Kwale. The primary channels of communication for this campaign were highlighted as including the community health care workers working through group discussions and household visits; promotional materials such as t-shirts and as mass media communication platforms such as local radio stations and TV (mainly Citizen TV and NTV). Message takeout and recall included net use, male involvement in hanging of nets, child involvement, and case management for malaria. In most instances, messaging on uptake of Intermittent Preventive Treatment in pregnancy (IPTp) for prevention of malaria in pregnancy only come out upon prompting.

Through observation, although some health facilities had posters plastered on walls very few community members reported seeing the Shujaa campaign posters. Posters are an auxiliary platform for communication and from the findings, there is a gap which may be filled by in addition to posters, employing complementary approaches as undertaken by the campaign.

The roles of different members of the community in malaria prevention were also a key take out of the Shujaa communication, specifically, the role of children and men. Children and men emerged as critical change agents in advocating for uptake of the desired behavior of net use.

> “I saw it on NTV at 7pm and 9pm. The child involvement excited my grandchildren since then they are always asking me to tuck them into the net before they sleep.” Female FGD, Bungoma.

> “As a man I have learned that I also have a special role to prevent cases of malaria in my household by ensuring that my children and my wife are sleeping under a net.” Male FGD, Busia.

**Maliza Malaria campaign**

There was limited awareness of the Maliza Malaria campaign. Those aware of the campaign reported having been exposed through posters at health facilities and through TV and t-shirts. The main message takeout was consistent with the Shujaa campaign message and focused on consistent net use, case management and use of IPTp for prevention of malaria in pregnancy.

> “I saw it at the hospital. There was a poster that was talking about sleeping under a net and it was written Maliza Malaria.” Female FGD, Kericho.

> “I saw it on a poster here at the facility. The use of the entire family in the net means that the males are also involved in enhancing net usage. The malaria in pregnancy segment shows that the woman has been accompanied by her husband.” CHEW KII, Siaya.

This shows the gaps in reach as well as the need for an extended reach and complementary platforms (such as the use of healthcare providers), complimenting and coordinating communication. This applies to both campaigns, especially since they mirror each other in [LLIN User Preferences Qualitative Study, 2019]
message takeout. The community challenge approach is clearly a strategy that has the potential to yield results as experienced in the net hanging sessions in areas where the challenge was implemented. Knowledge, community involvement and individual and family responsibilities are drivers for the desired behaviors.
CONCLUSION AND RECOMMENDATIONS
The following are some of the conclusions and recommendations drawn from the findings of the study:

Conclusions

Preferred net attributes

Households prefer nets that are longer, conical in shape, blue in colour and with a soft/polyester texture because it facilitates the consistent use of LLLIN.

Net hanging coping strategies

Communities have different coping strategies of ensuring that shorter nets fit such as: the use of extended ropes with the provision of the loops on the nets; use cloth hanging lines to fit the nets bringing them closer to the sleeping space; and use of stools and other tools to hold each side of the net. However, some household members (especially men) still do not know how to hang a net. In addition, the challenges are harder to mitigate when individually hanging the net in one’s house. Various strategies also emerged that enable households to work with rectangular nets, being the most commonly owned, but which are harder to work with affecting consistent net use. These include; tying one side of the net; tying the net closer to the sleeping space, especially if this is on the floor and using various tools to support the net around a sleeping space.

Enabling factors for net registration and distribution during mass destruction exercises

Use of the community health strategy and other administrative and local leaders, use of CHVs, village elders, use of identity cards (IDs) during registration, use of the universal coverage (1 net for 2 persons in a household) policy, timing of the registration (either during planting season and election period and daytime when members are not at home) are some of the factors that influenced registration, and hence net distribution and ownership.

Effective communication channels: Multiple channels such as radio, television (TV) and community-based initiatives using public address systems, use of administration and community elders and community health workers contribute to a wide reach during net registration and distribution.

Effectiveness of “Shujaa” and “Maliza Malaria” campaigns: The campaigns had a relatively modest reach. However, there was a higher reach in areas where the campaigns were ran through community-level initiatives such as interpersonal interventions by CHVs. In these areas, there was also a higher knowledge and expected behavior uptake on net ownership and retention. The use and placement of posters is considered supplementary and not a key channel of communication.

[LLIN User Preferences Qualitative Study, 2019]


Recommendations

Any decisions made around LLINs specifications need to consider the expected outcomes of issuing them and consequently, use. Given that this is the best strategy against malaria infection, considerations should be made not only on the number of LLINs given to households but also on barriers that may influence the consistency of use. Whereas households may apply some strategies to work with nets which are shorter and rectangular in shape, the situation at households where this exercise is individually undertaken should be assessed and necessary support provided. Further, any decisions to change the length/height of LLINs should consider the ability to hang up these LLINs to drive consistent use.

Strategies such as financial and physical resource allocation should be put in place to mitigate challenges associated with logistical issues of registration and distribution of nets. Other strategies to be put in place include increasing the time for registration and adopting various methodologies to effectively ensure higher coverage as well as proper timing for registration. Tracer and routine community health strategies for registration of households and their members should be adopted in ensuring higher net coverage.

Communication around the mass net exercise should be extended both time-wise and geographically to cover as wide an area as possible. The period of net distribution should be planned away from political events and should occur at a time when majority of household members are available in the household.

There is need to increase efforts at the community level that address key behaviors (e.g. net use) by relating the messaging in mass media (including posters) with desired behavior. In addition, there is need to accurately communicate the reason for the use of IDs for registration for mass nets.
REFERENCES


[LLIN User Preferences Qualitative Study, 2019]


Appendix: Study tools

Group Session Guide

Post Mass Long Lasting Insecticide Net (PMLLIN) Qualitative Study

GROUP SESSION GUIDE FOR DISCRETE CHOICE EXPERIMENT (DCE)

CONSENT

Introduction

Population Services Kenya (PS Kenya) in conjunction with the Ministry of Health’s National Malaria Control Programme (NMCP) are conducting a qualitative study on net use following the mass net distribution exercise conducted in 2017/2018. We want to better understand consumer experiences during this exercise, including the campaign, distribution experiences, preferences of nets and disposal of nets.

We are telling you about this study because we would like you to participate in it. By participating you will help us to better understand issues with current net distribution channels. This will also inform our design on whether to improve future net distribution. The information you provide us will also help us to better understand the types of nets people like you prefer and where possible, incorporate your desires in future design of nets.

Importance of the study

For this study we will be doing group sessions which will have a short individual exercise and group discussions. We will also speak to key persons involved in this exercise. The information we gather will be used to better design the mass net distribution exercise.

Who can participate?

You are being invited to take part in a group session in this study because we feel that you have requisite information on this topic. We aim to conduct 34 group discussions in counties around Lake Victoria, the coastal region and in western highlands which experience high number of Malaria cases in Kenya.

Voluntary participation

Your participation in this study is completely voluntary. You will make the choice about whether you will participate or not. If you do not agree to participate in the study, you will continue to receive all services that you usually get in your community.

Procedures

[LLIN User Preferences Qualitative Study, 2019]
12-10 Participant will be recruited from the selected sampling units and will be and be requested to meet at a venue where they will be engaged in a discussion. Participants will be a briefed about the moderator and Note takers roles during the discussion and informed about audio recording of the proceedings. Participants will be provided with different types of nets to engage with in order to facilitate the discussion on characteristics and preferences. The respondents will be asked to also participate in a net hanging session and discuss any challenges faced in the process.

**Study and interview length**

The group session will take approximately one and a half hours and will have about 8-12 people in them who are similar in age and gender.

**Possible risks in participating**

We do not anticipate any risks in taking part in this study. However, should you experience any discomfort in taking part in this study, you have the right to refuse to answer any questions that you do not want to answer. You may skip questions without consequences. There is a risk that information provided in this study may be exposed to a third party as even though group members in this session will be asked to keep the information from the discussion confidential, this may not be guaranteed. We will make every effort to ensure that the information you share with us is private and confidential. To further protect your confidentiality, we will not collect any information that could be used to identify you.

**Benefits**

There will be no direct benefits to participating in this study. However, this study may benefit households in settings like this to improve use of ITNs to prevent malaria infection.

**Protection of your information and confidentiality**

You will be identified in our research records by a code number. This code number will be used instead of your name. We will not collect any information that could be used to identify you. Before the start of the discussion, participants will be assigned numbers R1-R10 to avoid use of names or any identifiers to ensure confidentiality. Upon consent by participants, we will record the session which will be used for transcription and data used analysis for this study only. The recording will be destroyed after it is transcribed and will not be shared with anyone outside of the research team.

**Your right to participate or withdraw consent**

You do not have to agree to take part in this study if you do not wish to do so. Even if you agree to take part in this study but decide otherwise later, you will be free to leave at any point and there will be consequences. We will respect your decision. You can also decide not
to answer any questions that we ask you if you do not want to answer them. If you do not participate in this study, you will continue to get all the services that you usually get in your community.

Compensation

You will not be paid for participation in this study. We will however provide refreshments and reimburse you for the transport cost you may have incurred to get to the study venue.

Questions

If you have any questions about this study you may contact Dr. Hildah Essendi, the Principal Investigator for this project who is based in Nairobi Kenya via Tel: 020-271 4346/54/55 or email hessendi@pskenya.org. If you have any questions or concerns about your rights as a research participant you may contact The Research Officer, AMREF Kenya, Wilson Airport, Lang'ata Road, Telephone (020-6994000); Fax (+254 20-606340); P.O. Box 30125-00100 Nairobi, Kenya.

Content statement

The study has been explained to me. I have had the opportunity to ask questions about it, and any question I have asked have been answered to my satisfaction. I consent voluntarily to:

- To be a participant in this study
- To be recorded during the interview or group session

Signature of respondent ________________________________

Date (DD/MM/YYYY) ________________________________

Signature of witness ________________________________

Date (DD/MM/YYYY) ________________________________

1. STUDY BACKGROUND INFORMATION

The **main** objective of this study is:-

To assess the preference of net height, size, shape, texture, colour, effectiveness and opinions about nets and its influence on use for malaria prevention in endemic regions in Kenya.

**Specific** objectives include:-

- To quantify respondents’ preference of nets based on a number of attributes

[LLIN User Preferences Qualitative Study, 2019]

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across **net height, size, colour, shape and texture**

- The study will seek to understand how respondents balance these attributes and the relative importance of each of these attributes to their decisions to use the nets
- For example, do the preferred attributes impact use in their absence
  - Whether respondents may still use nets in the absence of preferred attributes
  - An investigation of willingness to pay for a net
  - A further investigation of enablers and barriers to net use
    - This will include program and community led factors and strategies that would increase net retention and use
  - An investigation of net disposal, including:
    - Decisions around disposal
    - Factors influencing disposal
    - How disposal of nets is done
  - An investigation of net use campaign messaging

2. **TARGET RESPONDENTS**

- Household members who received nets during the mass net distribution
- Household members who did not receive nets during the mass net distribution
- Heads of household

3. **INTRODUCTION (5 min)**

- Moderator to introduce self, PS Kenya and the purpose of the research
- Explain that this is a free discussion and there are no right or wrong answers
- Ask for permission to use a recorder
- Assure them of confidentiality
- Explain how long the session will take
- Rules for discussion – one person at a time

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[LLIN User Preferences Qualitative Study, 2019]

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• Request respondent/s to switch off mobile phones to avoid interruptions

**Notetaker: Complete this table with each participant before start of session**


**DISCUSSIONS**

1. **Registration process**

*Before the mass net distribution, households in this community were registered to receive nets.*

Who did the registration? How was it done in your community?

What if anything did you like about the registration of the households by the CHVs for mass net distribution? Why?

What if anything did you not like about the registration of the households by the CHVs for mass net distribution? Why?

Some houses were registered and some were not. What are some of the reasons that households were not registered? **Probe:** Challenges from the households and from those registering e.g. access to households, lack of time, tools, bias, resources and favoritism.

What can be done better next time to ensure all households are registered to receive nets? By who? Why?

What were some of the variables considered for the number of nets a household would receive? What would you like to remain and/or to be changed? **Probe** for sleeping spaces, existing nets (number and state), type of household, type of net, cultural factors (such as boys cannot sleep with girls or in same room with father)

2. **Net distribution procedure / Access**

After registration, briefly outline the steps to a/your household to receive a net after registration? **Probe:** Use of a slip/voucher, Choice of post, waiting period, any other?

What did you do to ensure your household received a net? **Probe:** Why do you think that some houses did not receive nets? **Probe:** Why were they away or refused the nets?

Do you feel there was any compensation required/insinuated by the CHVs, or community leaders’ to make small contributions to the volunteers (in cash or ‘in kind’) as compensation for their work during the mass net distribution?

What do you feel can be done to improve the net distribution procedure in the mass distribution campaign? What has worked in this community?

Over time after mass net distribution, the expectation is that the number of nets in the households increases. During the PMLLIN, it still shows that there is a discrepancy despite the extended reach, what do you think leads to the reduction in number of nets in the household?

Do you understand universal net coverage? What does it mean to you and do you think it should be a priority for your household to attain this?

**Interviewer:** Explain universal coverage after the session for clarity

3. **Campaign Messaging**
Before the registration process, what was the key messaging that you heard/were passing out in / to the community? What channels of communication were used? Who decided where to pick the net? Where did you pick the net? What proportion of the population do you think was reached by the communication by channel(s) mentioned above (That is, out of the households in your neighborhood, how many do you think were reached by the communication mentioned above – is it a few, about half or many?) and why? What else can be done to ensure majority are reached? Why?

If anything, what would you change about the messaging for the mass net distribution? Probe: the message takeout, the channels of communication e.g. CHV, Barazas, PA system, any other channel? Please specify. What channel would you prefer to be reached through - why?

How did the timing of the communication affect the registration process? Probe: Political affiliation, holiday period when individuals are all home, season, any other? Please specify

4. Malaria Campaigns
   a. SHUJAA Campaign

Have you heard or seen the Malaria Shujaa campaign? Where?

Where have you heard or seen this campaign?

What message do you remember from this campaign?

What if anything do you like about the Malaria Shujaa campaign? Why? What if anything would you change about the Malaria Shujaa campaign? Why?

Prompted: Have you seen/heard this campaign in your community? What do you call it?

**Moderator show campaign.**

What effect would you want the Malaria Shujaa campaign to have in the community? **Probe:** Male involvement, involvement of young children, community challenging each other.

What else from what you mentioned do you think the Malaria Shujaa campaign should incorporate to encourage consistent net use for everyone in this county?

b. Maliza Malaria Campaign

Have you heard or seen the Maliza Malaria campaign? Where?

Where have you heard or seen this campaign?
What message do you remember from this campaign?

What if anything do you like about the Maliza Malaria campaign? Why? What if anything would you change about the Maliza Malaria campaign? Why?

Prompted: Have you seen/heard this campaign in your community? What do you call it? Moderator show campaign.

What effect would you want the Maliza Malaria campaign to have in the community? Probe: Male involvement, involvement of young children, community challenging each other.

What else from what you mentioned do you think the Maliza Malaria campaign should incorporate to encourage consistent net use for everyone in this county?

Briefly mention other malaria related messaging that you have heard / seen in this community and the takeout of these messaging? **Probe:** “Lala ndani ya neti” campaign.

5. **Willingness to pay for nets**

How willing would you be to buy a net for your household if free nets were unavailable?

- What considerations would you make in this decision?
- Who would make the decision to buy/purchase the net?

How much you would be willing and able to pay for an insecticide treated mosquito net?

- Can you give me an average of how much you would be willing to pay for an ITN. Why would you be willing to pay this much for an ITN?
- Can you give the highest price that you would be willing to pay for an ITN. Why do you give this as the highest price that you would be willing to pay for an ITN?
- Can you give the lowest price you would be willing to pay for an ITN. Why do you give this as the lowest price that you would be willing to pay for an ITN?

6. **Net disposal**

**Moderator:** Now I would like to discuss the process and decisions to dispose off nets in your households

[LLIN User Preferences Qualitative Study, 2019] 41
What considerations do you make before deciding whether or not to continue using an ITN?

- Whose decision is it often to dispose of nets? **Probe:** man of house, woman of the house, caregiver – women, grandmother- paternal/maternal?
- What considerations are often made when disposing off nets? **Probe:** has holes, is not long enough, doesn’t cover the whole sleeping space, height of ownership, other
- How does your household often dispose off nets: **Probe:** give it to relatives/friends/neighbors, burn, bury, use as chicken coop, use protect vegetable garden, use for fishing, other
- Do you know the proper disposal process for nets?

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<td>Provide respondents with nets as detailed below. Let them feel the nets and have a good look at the nets.</td>
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1. Height:
   a. 2014/15 net (210 cm or longer)
   b. 2017/18 net (180cm)
2. Colour:
   a. Blue net
   b. White net
3. Texture
   a. Polyethylene
   b. Polyester
4. Shape
   a. Rectangular
   b. Conical
5. Other attributes

   **Moderator:** ask respondents to take five minutes to look at the nets

A. Ask each respondent to fill in their preference on the specific attributes in a sheet/table provided. This exercise should be done with each respondent individually in order to reduce a bias of responses. Ensure that the nets are well labeled and maintain the same labeling throughout the survey.

7. **Discussion following the filling of Table 2 on attributes**
   a. What combination of attributes would you choose?
   a. Ask respondents to rank the preferred net based on the four attributes (height, colour, shape and texture)
b. What attribute if any would take the highest priority to influence net use? Ask: Why? What is the second highest attribute that would influence you to use the net?

c. What attribute if any would take the lowest priority in considering using the net. Give reasons for these choices
   i. What factors would you consider in using a net which did not have your preferred attributes?
   ii. If you were given a net which was longer/shorter aside from your preferred height, would you use it in your household? Why/why not?
   iii. If you were given a net which had another colour aside from your preferred colour, would you use it in your household? Why/why not?
   iv. If you were given a net which had another shape aside from your preferred colour, would you use it in your household? Why/why not?
   v. If you were given a net which was another texture aside from your preferred texture, would you use it in your household? Why/why not?
   vi. What if any would be a major attribute that would make you not use a net in your household apart from the ones already discussed? Why?
   vii. What if the net did not have this attribute XXX what would you do

b. Please tell me why you chose the attributes that you did
   a. What height did you choose and why?
   b. What colour did you choose and why?
   c. What shape did you choose and why?
   d. What texture did you choose and why?
   e. What other attribute not specified would you also consider in a net?

8. Discussion following the net hanging exercise

Please discuss issues around the short net and then the long one separately

c. Please tell me what you found easy in hanging the net (probe for the different sleeping spaces)

d. Please tell me what you found difficult in hanging the net (probe for the different sleeping spaces)

e. How does this exercise and process vary from how we hang nets in our households

f. Who in the household is important in putting up nets for sleeping? Why?

g. How will this exercise influence hanging of nets at our households moving forward?

h. How long does it take you to wash a net?

i. Do you air your nets before hanging? Probe: Where do you air it? For how long do you air it?

j. What do you do with when a net is torn?
CONCLUSION

We have come to the end of our discussion. Do you have any comments or suggestions you would like to share regarding our discussion today?

THANK THE RESPONDENTS AND CLOSE THE SESSION

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**Notetaker: Tick the preferred attribute against the main 4 for each respondent**

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KII Guide – community and county leadership

Post Mass Long Lasting Insecticide Net (PMLLIN) Qualitative Study

KEY INFORMANT INTERVIEW GUIDE

CONSENT

Introduction

Population Services Kenya (PS Kenya) in conjunction with the Ministry of Health’s National Malaria Control Programme (NMCP) are conducting a qualitative study on net use following the mass net distribution exercise conducted in 2017/18. We want to better understand consumer and stakeholder experiences during this exercise, including the campaign, distribution experiences, preferences and disposal of nets.

We are telling you about this study because we would like you to participate in it. By participating you will help us to better understand how to better design future distribution of nets. The information you provide us will also better improve the design of future distribution exercises.

Importance of the study

For this study we will be doing sessions/discussions as well as individual interviews with key persons involved in this exercise. The information we gather will be used to better design the mass net distribution exercises.

Who can participate?

You are being invited to take part in a group session in this study because we feel that they have requisite information on this topic. We are trying to conduct about 34 group sessions/discussions and about 23 key informant interviews across malaria endemic and epidemic zones across the country. We are therefore speaking to people residing in these zones as well people involved in the distribution exercise in these zones as well as nationally.

Voluntary participation

[LLIN User Preferences Qualitative Study, 2019]
Your participation in this study is completely voluntary. You will make the choice about whether you will participate or not. If you do not agree to participate in the study, you will continue to receive all services that you usually get in your community.

**Procedures**

We will make an audio recording of the group session to be used during data analysis. The recording will be destroyed after it is transcribed and will not be shared with anyone outside of the research team.

**Study and interview length**

This interview will take approximately 45 minutes.

**Possible risks in participating**

We do not anticipate any risks in taking part in this study. However, should you experience any discomfort in taking part in this study, you have the right to refuse to answer any questions that you do not want to answer. You may skip questions without consequences. There is a risk that information they provided for this study is seen by a third party who is known to you. We will make every effort to ensure that the information you share with us is private and confidential. To further protect your confidentiality, we will not collect any information that could be used to identify you.

**Benefits**

There will be no direct benefits to them for participating in this study. However, this study may benefit households in malaria epidemic and endemic zones in the country to improve use of ITNs to prevent malaria infection.

**Protection of your information and confidentiality**

You will be identified in our research records by a code number. This code number will be used instead of your name. We will not collect any information for this study that could be used to identify you.

**Your right to participate or withdraw consent**

You do not have to agree to take part in this study if you do not wish to do so. Even if you agree to take part in this study but decide otherwise later, we will not force you to take part in the study. You can also decide not to answer any questions that we ask you if you do not want to answer them. If you do not participate in this study, you will continue to get all the services that you usually get in your community.

**Compensation**

[LLIN User Preferences Qualitative Study, 2019]

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You will not be paid for participating in this study.

**Questions**

If you have any questions about this study you may contact Dr. Hildah Essendi, the Principal Investigator for this project who is based in Nairobi Kenya via Tel: 020-271 4346/54/55 or email hessendi@pskenya.org. If you have any questions or concerns about your rights as a research participant you may contact The Research Officer, AMREF Kenya, Wilson Airport, Lang’ata Road, Telephone (020-6994000); Fax (+254 20-606340); P.O. Box 30125-00100 Nairobi, Kenya.

**Content statement**

The study has been explained to me. I have had the opportunity to ask questions about it, and any question as I have been asked have been answered to my satisfaction. I consent voluntarily to:

- To be a participant in this study [ ]
- To be recorded during the interview [ ]

Signature of respondent ________________________________

Date (DD/MM/YYYY) ________________________________

Signature of witness ________________________________

Date (DD/MM/YYYY) ________________________________

**4. STUDY BACKGROUND INFORMATION**

The **main** objective of this study is:-

To assess your experiences and perceptions around the design of the mass net distribution exercise that took place in 2017/18.

**Specific** objectives include:

- Assess the status of net uptake and use and factors influencing this
  - Explore further enablers and barriers associated with net use
  - Explore alternative use of nets in areas of jurisdiction
  - Explore program and community led factors and strategies that would increase net retention and use.
- Explore perceptions around willingness to pay for nets
- Explore the informants’ role in the campaigns to encourage uptake of nets

**5. TARGET RESPONDENTS**

- County and sub-county Malaria Focal Persons.
• CHEWs coordinating mass net and also shujaa campaign.
• CHVs coordinating mass net and shujaa campaign.

6. INTRODUCTION (5 min)
• Moderator to introduce self, PS Kenya and the purpose of the research
• Explain that this is a free discussion and there are no right or wrong answers
• Ask for permission to use a recorder
• Assure them of confidentiality
• Explain the session length

7. ICE BREAKER – ALL RESPONDENTS
• Please tell me your name and the organization/county you work for
• For how long have you worked in this organization?
• What is your position in this organization/ county?
• Tell me more about your job: what do you do? What does it entail with regard to nets?

5. NET USE & ALTERNATIVE USE – ALL RESPONDENTS
  o In your own opinion, what do you think is the status of net use in this County/Country? By net use I mean people using nets consistently and who sleep under an ITN every night, including last night. Why?
    ▪ Probe for percentages of net coverage, net use among the children under 5 and pregnant women
  o Despite the mass net distribution that happened in 2017/18 in endemic and epidemic zones in Kenya, why do you think there is still new incidences of malaria reported in these zones?
  o What are the factors that influence net use in this County/Country? Why?
  o What effect do these factors have on net use in this community/country?
    ▪ Height?
    ▪ Colour?
    ▪ Shape?
    ▪ Texture?
    ▪ Also probe for: Newness, availability, chemical component, strength and size of holes
  o What other factors influence net use in the country/county/ sub county?
  o Which perceptions about nets influence use of nets in this sub county?
    ▪ Probe benefits of nets such as prevention of malaria, prevention of cost of treatment of malaria, availability of nets, newness of nets
    ▪ Probe barriers such as, chemical component/smell of chemical bedbugs, seasonality, and rainy season, sleeping space, religious and cultural myths about nets.

[LLIN User Preferences Qualitative Study, 2019]
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6. REGISTRATION AND COMMUNICATION

1. Registration process

Before the mass net distribution, households in this community were registered to receive nets.

[LLIN User Preferences Qualitative Study, 2019]
o What if anything did you like about the registration of the households? Why?

o What if anything did you not like about the registration of the households? Why?

o What role did you play to the mass net distribution before the mass net distribution exercise?

o Who else was involved in the registration process and what was their role?

o How best can your/their role be utilized to ensure efficiency of the registration process

o Some houses were registered and some were not. What are some of the reasons that households were not registered? **Probe: Challenges from the households and from those registering e.g. access to households, lack of time, tools, bias, resources and favoritism.**

o What can be done better next time to ensure all households are registered to receive nets? By who? Why?

o What were some of the variables considered for the number of nets a household would receive? What would you like to remain and/or to be changed? **Probe for sleeping spaces, existing nets (number and state), type of household, type of net, cultural factors (such as boys cannot sleep with girls or in same room with father)**

1. Campaign Messaging
   - What was your role in the mass net campaigns on net distribution in this county/Country/?
     o What if anything did you like about the communication about the mass net campaign? Why?
     o What if anything would you change/want to be done better would you change about the communication of the mass net campaign? Why?
     o What effect did the communication have on net access, ownership and subsequent use?
     o Would you say you are satisfied with how these campaigns are conducted? Kindly explain.
     o What would you say are the main challenges that while conducting these campaigns?
     o What more should these campaigns incorporate to motivate and encourage more county/country residents to use mosquito nets?

NET USE CAMPAIGNS

SHUJAA Campaign

o Have you heard or seen the Malaria Shuja campaign? Where?

o Where have you heard or seen this campaign?
- What message do you remember from this campaign? Probe for messages on net use, case management and IPTP
- What if anything do you like about the Malaria Shujaa campaign? Why? What if anything would you change about the Malaria Shujaa campaign? Why?
- What effect would you want the Malaria Shujaa campaign to have in the community? Probe: Male involvement, involvement of young children, community challenging each other.
- What else from what you mentioned do you think the Malaria Shujaa campaign should incorporate to encourage consistent net use for everyone in this county?

**Maliza Malaria Campaign**

- Have you heard or seen the Maliza Malaria campaign? Where?
- Where have you heard or seen this campaign?
- What message do you remember from this campaign?
- What if anything do you like about the Maliza Malaria campaign? Why? What if anything would you change about the Maliza Malaria campaign? Why?
- What effect would you want the Maliza Malaria campaign to have in the community? Probe: Male involvement, involvement of young children, community challenging each other.
- What else from what you mentioned do you think the Maliza Malaria campaign should incorporate to encourage consistent net use for everyone in this county?

**THANK RESPONDENT AND END DISCUSSION**
Introduction

Population Services Kenya (PS Kenya) in conjunction with the Ministry of Health’s National Malaria Control Programme (NMCP) are conducting a qualitative study on net use following the mass net distribution exercise conducted in 2017/18. We want to better understand consumer and stakeholder experiences during this exercise, including the campaign, distribution experiences, preferences and disposal of nets.

We are telling you about this study because we would like you to participate in it. By participating you will help us to better understand how to better design future distribution of nets. The information you provide us will also better improve the design of future distribution exercises.

Importance of the study

For this study we will be doing sessions/discussions as well as individual interviews with key persons involved in this exercise. The information we gather will be used to better design the mass net distribution exercises.

Who can participate?

You are being invited to take part in a group session in this study because we feel that they have requisite information on this topic. We are trying to conduct about 34 group sessions/discussions and about 23 key informant interviews across malaria endemic and epidemic zones across the country. We are therefore speaking to people residing in these zones as well people involved in the distribution exercise in these zones as well as nationally.

Voluntary participation

[LLIN User Preferences Qualitative Study, 2019]
Your participation in this study is completely voluntary. You will make the choice about whether you will participate or not. If you do not agree to participate in the study, you will continue to receive all services that you usually get in your community.

**Procedures**

We will make an audio recording of the group session to be used during data analysis. The recording will be destroyed after it is transcribed and will not be shared with anyone outside of the research team.

**Study and interview length**

This interview will take approximately 45 minutes.

**Possible risks in participating**

We do not anticipate any risks in taking part in this study. However, should you experience any discomfort in taking part in this study, you have the right to refuse to answer any questions that you do not want to answer. You may skip questions without consequences. There is a risk that information they provided for this study is seen by a third party who is known to you. We will make every effort to ensure that the information you share with us is private and confidential. To further protect your confidentiality, we will not collect any information that could be used to identify you.

**Benefits**

There will be no direct benefits to them for participating in this study. However, this study may benefit households in malaria epidemic and endemic zones in the country to improve use of ITNs to prevent malaria infection.

**Protection of your information and confidentiality**

You will be identified in our research records by a code number. This code number will be used instead of your name. We will not collect any information for this study that could be used to identify you.

**Your right to participate or withdraw consent**

You do not have to agree to take part in this study if you do not wish to do so. Even if you agree to take part in this study but decide otherwise later, we will not force you to take part in the study. You can also decide not to answer any questions that we ask you if you do not want to answer them. If you do not participate in this study, you will continue to get all the services that you usually get in your community.

**Compensation**

[LLIN User Preferences Qualitative Study, 2019]
You will not be paid for participating in this study.

Questions

If you have any questions about this study you may contact Dr. Hildah Essendi, the Principal Investigator for this project who is based in Nairobi Kenya via Tel: 020-271 4346/54/55 or email hessendi@pskenya.org. If you have any questions or concerns about your rights as a research participant you may contact The Research Officer, AMREF Kenya, Wilson Airport, Lang’ata Road, Telephone (020-6994000); Fax (+254 20-606340); P.O. Box 30125-00100 Nairobi, Kenya.

Content statement

The study has been explained to me. I have had the opportunity to ask questions about it, and any question as I have been asked have been answered to my satisfaction. I consent voluntarily to:

- To be a participant in this study

- To be recorded during the interview

Signature of respondent ________________________________

Date (DD/MM/YYYY) ________________________________

Signature of witness ________________________________

Date (DD/MM/YYYY) ________________________________

8. STUDY BACKGROUND INFORMATION

The main objective of this study is:
To assess your experiences and perceptions around the design of the mass net distribution exercise that took place in 2017/18.

Specific objectives include:

• Assess the status of net uptake and use and factors influencing this
  o Explore further enablers and barriers associated with net use
  o Explore alternative use of nets in areas of jurisdiction
  o Explore program and community led factors and strategies that would increase net retention and use.

• Explore perceptions around willingness to pay for nets

• Explore the informants’ role in the campaigns to encourage uptake of nets

9. TARGET RESPONDENTS

• Members of C/SCHMT linked to mass net distribution and shujaa activities

[LLIN User Preferences Qualitative Study, 2019]
• Members of the NMCP technical team closely involved in the campaign(s).

10. INTRODUCTION
• Moderator to introduce self, PS Kenya and the purpose of the research
• Explain that this is a free discussion and there are no right or wrong answers
• Ask for permission to use a recorder
• Assure them of confidentiality
• Explain the session length

11. ICE BREAKER – ALL RESPONDENTS
• Please tell me your name and the organization/county you work for
• For how long have you worked in this organization?
• What is your position in this organization/county?
• Tell me more about your job: what do you do? What does it entail with regard to nets?

6. NET USE & ALTERNATIVE USE
o In your own opinion, what do you think is the status of net use in this County/Country? By net use I mean people using nets consistently and who sleep under an ITN every night, including last night. Why?
  - **Probe for percentages of net coverage, net use among the children under 5 and pregnant women**
  - Despite the mass net distribution that happened in 2017/18 in endemic and epidemic zones in Kenya, why do you think there is still new incidences of malaria reported in these zones?
  - What are the factors that influence net use in this County/Country? Why?
  - What effect do these factors have on net use in this community/country?
    - Height
    - Colour?
    - Shape?
    - Texture?
    - Also probe: Newness, availability, chemical component strength and size of holes

o What other factors influence net use in the country/county/sub county?

o Which perceptions about nets influence use of nets in this sub county?
  - Probe benefits of nets such as prevention of malaria, prevention of cost of treatment of malaria, availability of nets, newness of nets
  - Probe barriers such as, chemical component/smell of chemical bedbugs, seasonality, and rainy season, sleeping space, religious and cultural myths about nets.

o What are your suggestions to increase net use in this county/sub-county? **Interviewer:** Refer to challenges to net use mentioned above and ask mitigation measures.

[LLIN User Preferences Qualitative Study, 2019]
○ What measures has the community undertaken so far to increase consistent net use? Ask specific examples.
○ What factors influence other uses of nets in this county/country other than for sleeping? Probe: newness of the net, availability/access to more nets, colour, shape, length of nets.
○ What types of nets are used for alternative uses? Why?
○ Who decides what and which net is used for other uses? Why? Probe: culture, SES and continue probing by asking any other?
  ○ What do people consider in determining that a net is not fit to use?

**Moderator**: Now I would like to discuss the process and decisions to dispose off nets in your households

What considerations do people make before deciding whether or not to continue using an ITN?

- Whose decision is it often to dispose of nets? **Probe**: man of house, woman of the house, caregiver – women, grandmother- paternal/maternal?
- What considerations are often made when disposing off nets? **Probe**: has holes, is not long enough, doesn’t cover the whole sleeping space, height of ownership, other
- How does your household often dispose off nets: **Probe**: give it to relatives/friends/neighbors, burn, bury, use as chicken coop, use protect vegetable garden, use for fishing, other
  ○ Do you people the proper disposal process for nets?
○ Would members/households in this community purchase a net if they do not have sufficient nets to use in the household? Why? How much would they spend?
○ How much are people in this community willing to pay for an insecticide treated mosquito net? **Probe**: What if the free nets were not available and people have no net?
  ○ Can you give me an average of how much you they be willing to pay for an ITN. Why would they be willing to pay this much for an ITN?
  ○ Can you give the highest price that they would be willing to pay for an ITN. Why do you give this as the highest price that they would be willing to pay for an ITN?
  ○ Can you give the lowest price they would be willing to pay for an ITN. Why do you give this as the lowest price that they would be willing to pay for an ITN?
○ What would influence how much they are willing to spend on a net? **Probe**: net length, net texture, net colour, perception of net efficacy. (**Moderator**: Link the question to the average price)
○ How would these factors influence the willingness to pay

5. COMMUNICATION
- What was your role in the mass net campaigns on net distribution in this county/Country/
- What role did you play to the mass net distribution before the mass net distribution exercise?
- Who else was involved in the registration process and what was their role?
- How best can your/their role be utilized to ensure efficiency of the registration process
  - What if anything did you like about the communication about the mass net campaign? Why?
  - What if anything would you change/ want to be done better would you change about the communication of the mass net campaign? Why?
  - What effect did the communication have on net access, ownership and subsequent use?
  - Would you say you are satisfied with how these campaigns are conducted? Kindly explain.
  - What would you say are the main challenges that while conducting these campaigns?
  - What more should these campaigns incorporate to motivate and encourage more county/country residents to use mosquito nets?

**NET USE CAMPAIGNS**

**SHUJAA Campaign**
- Have you heard or seen the Malaria Shuja campaign? Where?
- Where have you heard or seen this campaign?
- What message do you remember from this campaign?Probe for messages on net use, case management and IPTP
- What if anything do you like about the Malaria Shuja campaign? Why?  What if anything would you change about the Malaria Shuja campaign? Why?
- What effect would you want the Malaria Shuja campaign to have in the community?  Probe: Male involvement, involvement of young children, community challenging each other.
- What else from what you mentioned do you think the Malaria Shuja campaign should incorporate to encourage consistent net use for everyone in this county?

**Maliza Malaria Campaign**
- Have you heard or seen the Maliza Malaria campaign? Where?
- Where have you heard or seen this campaign?
- What message do you remember from this campaign?
- What if anything do you like about the Maliza Malaria campaign? Why?  What if anything would you change about the Maliza Malaria campaign? Why?
o What effect would you want the Maliza Malaria campaign to have in the community? Probe: Male involvement, involvement of young children, community challenging each other.
o What else from what you mentioned do you think the Maliza Malaria campaign should incorporate to encourage consistent net use for everyone in this county?

THANK RESPONDENT AND END DISCUSSION