CULTURE OF NET USE:
Exploring Net Use Behaviors and Perceptions Across Three African Countries

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BACKGROUND

Insecticide Treated Nets (ITNs) are the most cost-effective way to prevent malaria\(^1\)\(^2\). Since 2008, hundreds of millions of nets have been distributed in sub-Saharan Africa as tools for prevention.\(^3\)

Distribution programs typically focus on getting nets into households, but in 2009 there was little existing research on patterns of net use within the household and determinants of net use. NetWorks recognized the gap in existing knowledge, which led to the design and implementation of studies in three countries – Senegal and Uganda, and later Mali. Once nets are in the households, people need to actually use the net in order to be protected and must care for it appropriately for it to confer maximum protection for as long as possible. By understanding net use behaviors, it is easier to address any barriers to use either through social behavior change communication (SBCC) or provision of alternative prevention strategies. By understanding current behaviors, we can help people care for their nets in a way that allows for maximum protection for the longest possible time.

The work of NetWorks has initiated a larger dialogue on defining and exploring the culture of net use (CONU), which involves a range of perceptions, attitudes and behaviors that affect how and why people use nets. These include:

- Factors that promote or inhibit net use;
- How people allocate limited nets within a household;
- How they care for the nets; and
- When and how people decide that a net is no longer useable.

“I’m not really sure about what else or how else mosquito nets are used other than for preventing malaria. All my neighbors have mosquito nets and they are using them for preventing mosquito bites and for nothing else other than that. They only remove the nets from their places when they want to wash them and they return them back immediately after washing them.”

- Ugandan Study Participant

LEARNING FROM LLIN USERS

Culture of Net Use Study

The CONU studies used qualitative research methods to explore the context of household net use. These methods were selected to provide rich, detailed information on the topics of interest. The studies were not

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designed to provide generalizable results to the entire population in each country or to other countries. Methods were similar across countries and included in-depth interviews, focus group discussions, household mapping of sleeping spaces, sleeping space surveys, and observation of nets for each sleeping space were part of the study methods. The studies used an iterative process throughout, building on emerging themes to produce expansive information on the topics of interest.

In Senegal and Uganda, the study was planned over several phases – including rainy and dry seasons – in order to account for differences across the continent and sleeping habits across seasons. A single phase of the study was also conducted in Mali.

**COMMON THEMES**

**Motivations for Net Use**

Most respondents valued nets as an effective tool for preventing malaria by protecting against mosquito bites. They placed nets above other prevention tools, such as spray and coils. Respondents also believed that prevention of malaria was better than treatment.

In Senegal and Uganda, respondents mentioned that nets have an additional benefit of preventing other pests (such as fleas and mice) from biting at night. They also liked the décor that nets added to their homes and appreciated that nets could provide additional warmth during cooler weather.

Despite the fact that nets are perceived as valuable, many respondents in Senegal and Uganda reported that they were not willing to or able to pay for nets. Thus, they rely on nets distributed through mass campaigns and continuous distribution channels, like antenatal care for pregnant women. Users reported that their inability to pay for replacement nets affected their decisions about retiring nets.4

**Care & Repair**

The majority of respondents reported washing their nets regularly. However, the definition of regularly varied from twice a week to twice a year. In Mali, people reported washing their nets on average once a month. In Uganda, almost half of respondents reported washing their nets every week. In Senegal, about 25% of the nets were washed more than every two months.

Despite the WHO recommendation that LLINs be washed in soapy water and dried in the shade, the study found that nets were most often washed with Omo (a packaged laundry detergent that can affect the effectiveness of the insecticide) and dried in the sun. WHOPES criteria require that the insecticide on LLINs remain effective for at least 20 washes. These studies indicate that many nets are being washed too frequently and incorrectly.

Study participants who reported that they had repaired a net either tied knots in the net (more common) or used a needle and thread to close the holes. However, research teams observed many nets needing repairs and only a few repaired nets. Few respondents said that they would attempt to repair an old, torn net. In Senegal, where more attention was focused on this issue, respondents indicated that repair was a temporary solution to postpone the inevitable need to retire a net.

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4 The term “retired” refers to the time that users decide to take a net down and either store it for later use, repurpose it or dispose of it.
Challenges to Nightly Net Use

Recent research has noted that the most commonly reported barriers to net use are discomfort due to heat and perceived lack of mosquitoes. The CONU studies also explored respondents’ perceptions of barriers to net use. In Mali and Senegal, however, significant barriers were not found. Respondents mentioned a few bothersome issues with nets but stated that, globally, these did not prevent them from sleeping under nets on a regular basis. Across the countries, respondents mentioned that heat, reactions to net insecticide, outdoor or away-from-home sleeping habits occasionally got in the way of sleeping under nets every night.

In Uganda, however, social barriers exist that may prevent net use, specifically attending nighttime social gatherings, such as funerals. At these gatherings, cultural and physical barriers exist; using a net is perceived as showing off and there is no physical way to hang the net.

Additionally, across countries, misconceptions exist around malaria transmission, including major issues on the seasonality of transmission, which can lead to lower net use. Many in Senegal and Mali believed that sleeping under a net during the dry season is not necessary because mosquitoes aren’t seen during these months, despite year-round transmission. Most respondents knew that mosquitoes cause malaria, but many believed the disease could also be caused or exacerbated by sun, dirt, flies, food, dirty drinking water, improper hygiene, and a dirty environment. A few believed their children had been vaccinated against malaria or that measles vaccines also protected against malaria.

Deciding When a Net is “Expired?”

Respondents disagreed about when nets should be replaced or retired. Some thought that LLINs were effective until a replacement net arrived, either through a mass distribution or routine channel such as antenatal care visits (ANC). Others thought that once a net had a lot of holes, it should be retired.

Even when replacement nets were received, many people did not use them if their older net appeared to be in good shape. The visible integrity of the net was the most prominent criteria for respondents for determining whether a net is still useful and how a net is cared for and repaired.

Users did not consider reduced potency of the nets’ insecticide as a factor when deciding whether to retire a net. Many respondents in Mali and Senegal reported having seen expired nets used for gardening (protecting seedlings), containing animals, and transporting goods. In Uganda, expired nets were often reported to be thrown away or burned.

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6 Expired mosquito nets are those that are deemed no longer useful for malaria prevention, either due to lack of insecticide and/or multiple and/or large holes.
Sharing Nets Within Households

Intra-household net allocation becomes an issue when universal coverage has not yet been achieved. When nets are limited, households have to decide who gets priority for net use. It’s important to understand how these decisions are made.

Globally, respondents understood that pregnant women and children under five years of age were most susceptible to malaria. Further, the studies reflected other recent research in demonstrating that pregnant women and young children were most likely to be sleeping under a net.

Net culture exists within a target population when net use is expected, normative, and seen as protective or beneficial for malaria prevention, to prevent nuisance biting, and/or to promote comfortable sleep.

COUNTRY CALL OUTS

Perceived Differences in Free vs. Purchased Nets

The perceived value of free nets as compared with purchased nets was different across the three countries. In Senegal, respondents preferred nets purchased from pharmacies and believed these to be better quality than government-distributed free nets. They were confused about which nets contained the proper dose of insecticide to protect against malaria.

In Mali, people clearly appreciated and valued free nets more than purchased nets. When they cited disadvantages or problems with free nets, they complained about their inability to acquire them or to acquire a sufficient number of them for the members of their households. They perceived no difference in terms of the quality and efficacy of nets purchased in the market versus nets distributed as part of the mass distribution campaigns.

In Uganda, opinions were evenly divided; some respondents preferred nets distributed by the government because they were free and some preferred purchased nets. Some of the people who felt that free nets were inferior cited that newer nets from the government had larger mesh size, which was intended as a way to increase air-flow, but was perceived to allow mosquitoes to enter the net.

Insecticide Fears in Senegal

During the first phase of the study in Senegal, results indicated that perceptions of insecticides were a problem – perhaps even a significant barrier to net use. For the second phase, researchers probed more deeply into this issue. Respondents worried that insecticides were not good for their health. However, this did not prevent them from using their nets. Insecticides were considered more of a nuisance and not a barrier to net use.

Net Transformations in Senegal

In Senegal, study participants had strong feelings about the look and shape of nets. They preferred conical-shaped nets (which were believed to be easier to hang, with one point of contact instead of four) and nets of different colors (not white). Occasionally, people added colorful fabric to the bottom of the net, not only to make the net longer so it would fit their beds better, but to make it part of the room décor. Some people reported that the color and shape of the nets they received kept them from using these nets.
During Phase I of the CONU study in Senegal, about 37 of 146 nets observed had been transformed (mostly from rectangular to conical). This was often done poorly which led to holes in the top of the net. Responding to these findings, NetWorks created a video in Senegal that described correct ways to transform nets. They also created television ads and counseling aids that demonstrated how to transform their nets without damaging them.

**Sleeping Away from Home in Uganda**

The first phase of the study in Uganda showed that net use is uncommon when people sleep away from their homes. Therefore, researchers added additional questions to the second phase to identify reasons for being away from home and barriers to LLIN use when people sleep away from their homes.

Participants reported that in addition to sleeping outside during the hot season, they slept away from home for social events (such as weddings and funerals), livelihood activities (herding animals, working as a security guard, etc.), and in times of difficulty (arguments with their spouse, insurgency, hospital stays).

They identified several barriers to using nets during these times. The most prominent of these included social barriers, such as fear of appearing proud, physical barriers, such as not having a place to hang a net, and access barriers, such as not having an extra net with which to travel.

**NEXT STEPS**

These studies are some of the first to provide an in-depth look at how people view and interact with their nets over time. They clarify what people are doing with their nets and why they are doing it and provide insight into how these interactions change as nets age or new nets are added to households.

Research teams visited households throughout Mali, Senegal, and Uganda in order to bring net use behavior into focus. Based on the information presented, results show that a strong net use culture exists. But while people value their nets, they are not necessarily caring for the nets in ways that will ensure long-lasting effectiveness.

To ensure that bed nets are being used in a way that improves overall protection of individuals and communities, programs need not only to distribute nets, but also communicate to users on ways to care for and repair their nets and how to know when they need new nets. The NetWorks project has studied the effect of net care and repair communication campaigns in Uganda and Nigeria, the results of which contribute to better understanding how to promote net care and repair. This will contribute to more effective net use, and therefore, stronger malaria control.
Communication and Messages

Social and behavior change communication (SBCC) efforts are needed to increase year-round LLIN use, improve care and repair knowledge and practice, and help guide future plans for continuous distribution. The data collected during the CONU studies is extremely valuable when designing messages for these efforts. SBCC messaging should begin during the net distribution campaigns and continue to reinforce the importance of proper use and care.

The CONU studies indicate that net users need information on:

- How to care for nets: including proper handling and storage to prevent holes and tears, and repairing holes promptly.
- Washing of nets: appropriate frequency and drying methods.
- How to hang nets in different house configurations: include visual instructions that show how nets can be adapted to fit sleeping spaces or different types of rooms.
- Ways to prevent mosquito bites when sleeping away from the home, for example, using insecticides and spatial repellents.
- Misconceptions around re-treatment of LLINs.
- The need to cover all members of the family.
- How malaria is transmitted and effective preventative methods.
- The importance of net use throughout all seasons.
- How long nets can be expected to be effective.

Future Research Questions

More research is needed to determine the specific criteria that households use to decide who sleeps under nets when there are too few nets to protect everyone. While the studies revealed that pregnant women and very young children are prioritized first, it is not clear how nets are allocated to other household members.

Respondents reported using various other criteria including power (sometimes prioritizing the head of household), age (priority may be given to young children or all children), and gender (sometimes women are prioritized; other times men). A greater understanding of these criteria will support efforts to help users make the best decisions about net allocation in households with insufficient nets to cover every sleeping space. At the same time, the results of this study highlight the need to strengthen net distribution efforts so that households are less frequently forced to prioritize certain members over others.

The CONU study in Uganda provided in-depth information about issues related to net use when people are sleeping away from their homes. Future research should examine under what circumstances it is and is not feasible to promote net use for those sleeping outside the home. Where net use promotion is feasible, what adaptations are needed for particular contexts? Where net use promotion is not feasible, what alternative options are available?

It would also be useful to find out if this is an issue in other countries. Ugandan traditions and realities contribute to the significant number of nights people are away from their homes. This may also be true in other countries and, if so, it has strong implications for consistent net use. NetWorks is now looking at outdoor sleeping and other nighttime activities that affect net use in Ghana.

Additional research is needed to further understand when households decide to retire nets and how health communication programs can prolong useful net life and prevent damage through care and repair activities.
**CULTURE OF NET USE PUBLICATIONS**

Berthe et al. “When I sleep under the net, nothing bothers me; I sleep well and I’m happy”: Senegal’s culture of net use and how inconveniences to net use do not translate to net abandonment. Malaria Journal 2014, 13:357.


Monroe et al. “People will say that I am proud”: a qualitative study of barriers to bed net use away from home in four Ugandan districts. Malaria Journal 2014, 13:82.

**Additional Resources**

- ITN SBCC Toolkit: [https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication](https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication)
- Care & Repair Toolkit: [https://www.k4health.org/toolkits/care-repair-LLIN](https://www.k4health.org/toolkits/care-repair-LLIN)