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Access and Usage of Long Lasting Insecticidal Nets (LLIN) in rural Communities of Benue State, Nigeria

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Abstract

Introduction: The main target of long lasting insecticidal nets (LLINs) distribution in Nigeria is to have at least 80% of households in rural communities own two or more LLINs and children under five and pregnant women sleep inside LLINs.

Objectives: To determine access and usage of LLINs by women of reproductive age and under five children in rural communities of Benue State.

Methods: This was a cross-sectional descriptive study in which a structured questionnaire was administered to 420 respondents (household head). Four Local Government Areas (LGA) - Konshisha, Kwande, Obi and Okpokwu and a total of seventeen settlements were sampled based on set criteria: hard to reach communities with cultural and seasonal barriers. We selected households were selected based on the presence of under - five children in such households using a systematic random sampling technique. Data analysis was carried out using SPSS version 23 and results were presented in frequencies and percentages.

Results: Ninety three percent of the respondents used LLIN. Households had one (6%), two (26%), three (20%) and four (21%) bed-nets. The majority of the bed-nets were obtained from government hospitals (60%), mass campaign (30%) and open market (6%). Of those that used bed-nets regularly, 75% were male. The age distribution of net users was 0-59 months (67%), 6-14 years (8%) and 15-49 years (25%).

Conclusion: Access to bed-net was high however; regular usage among the female population was low. We recommend that advocacy on bed-net usage should be targeted at women of child bearing age.

Keywords: Children; Health; Community

Introduction

Malaria prevalence in every region of Nigeria is relatively high however, using a geostatistical predictive model, malaria prevalence and disease risk was higher in the south western and north central regions of Nigeria with Benue State having the highest prevalence [1]. The prevalence of malaria in rural population (36%) is three times that in urban populations (12%). Under-five mortality is estimated at 128 per 1,000 live births and maternal mortality is estimated at 576 per 100,000 live births. The objective of the National Malaria Strategic Plan (NMSP) 2014-2020 is to achieve universal coverage with insecticide-treated mosquito net (ITN) for the 97% of the population at-risk of malaria [2].

Use of insecticide treated bed nets (ITNs) is one of the most cost-effective interventions against malaria in endemic areas and is associated with significant reductions in malaria morbidity and mortality, particularly among pregnant women and children less than 5 years [3]. The introduction of long lasting insecticidal nets (LLINs) that retain insecticidal activity for 3-5 years, along with free distribution, has contributed greatly to recent increase in access and coverage of LLINs in rural communities [4]. In many countries, LLIN coverage has increased through a combination of delivery systems including routine public health services (antenatal clinics, routine vaccination visits), subsidized social marketing and integrated mass campaigns [5].

The targets for LLIN coverage and utilization as contained in the revised NMSP are 100% and 80% respectively i.e., universal coverage. According to the National Implementation Guide for LLIN Distribution, universal coverage translates to ownership of 2 LLINs per household and an assumption of five occupants per household [6].

In the year 2016, the Government of Benue State in conjunction with the President's Malaria Initiative; Roll Back Malaria; U.S. Agency for International Development (USAID) conducted a mass campaign and distribution of free LLINs in the state. This was done to increase access and usage of LLINs within the state [7]. There is presently very little empirical evidence on the access and usage of LLINs communities of

Benue State. Our focus in this paper is to report on access and usage of LLINs among women of child bearing age and of children less than five years of age in selected communities in Benue State, Nigeria.

Objectives of the Study

- To determine access to LLINs among women of child bearing age and children younger than five years of age in selected communities of Benue State, Nigeria.
- To determine the usage of LLINs among women of child bearing age and children younger than five years of age in selected communities of Benue State, Nigeria.

Methods

Benue State is located in the middle belt region of Nigeria with a population of about 4,253,641. The state has twenty three Local Government Areas and is inhabited are predominantly by Tiv, Idoma and Igede ethnic groups.

This was a descriptive cross-sectional study which a structured questionnaire was administered to 420 respondents (household head) who are resident in the selected communities. This sample size was determined using a population size of 601, 951, a confidence interval of 95%, margin of error +/- 5 and a standard deviation of 0.5 [7].

Four LGAs-Konshisha, Kwande, Okpokwu and Obi and seventeen settlements were selected based on set criteria which include: hard to reach communities with barriers such as cultural, security and seasonal barrier and communities with high population of under – five children. Households were selected based on the presence of under - five children. Using a systematic random sampling technique, respondents were selected from every 5th house from the identified eligible households.

A semi-structured interviewer-administered questionnaire consisting of three sections was used to obtain information on characteristics of respondents, access/ownership of LLINs and household protection from malaria. The questionnaire was pre-tested in Makurdi (the state capital) to determine its reliability. Respondents of the eligible households were interviewed individually using the questionnaire which was explained in simple English and also translated in native language to those who don't understand English language. In the selected Local Government, the following number of people were interviewed; Konshisha 96, Kwande 141, Okpokwu 111 and Obi 72. The questionnaires were administered by trained research assistants.

Data obtained were entered, cleaned and analyzed using the Statistical Package for Social Sciences (SPSS version 23). Results were presented as frequency and percentages.

Ethical clearance and approval was obtained from the Benue State Ethics Review Committee. Informed verbal consent was also obtained from individual research participant during data collection. The respondents were given the right to refuse to take part in the study as well as to withdraw at any time during

the interview. Privacy and confidentiality were maintained throughout the study. Participants were made to understand that their participation in the study would contribute towards future policy making and assist in the design of programmes that would help to improve access and usage of LLINs in Benue State and in Nigeria at large.

Results

Socio demographic characteristics of the study population

A total of 420 respondents were interviewed. Two hundred and eleven (50.2%) respondents were female and 209 (49.8%) were male. A majority (75%) of the respondents were between ages of 18 and 49 years and (89%) were married and living with their spouse. Thirty three percent of the respondents completed primary and 34% completed secondary education. Eighty-three percent of them were farmers. Twenty three percent of the respondents earned more than ₦20,000 monthly while 22% of respondents earned between ₦5,000 and ₦15,000 (Table 1).

Table 1 Socio-demographic characteristics of the respondents (n=420).

Socio-demographic characteristics	Frequency (n)	Percentage (%)
Gender		
Male	209	49.8
Female	211	50.2
Age		
Under 18 years	2	1
18-49	316	75
50-60	73	17
Above 60	29	7
Educational Level		
Primary (not completed)	140	33
Primary (completed)	63	15
Secondary (not completed)	141	34
Secondary (completed)	20	5
A level (not completed)	9	2
A level (completed)	4	1
University	-	-
Occupation		
Farmers	349	83
Civil servants	16	4
Trader	27	6
Student	14	3

Artisan	14	3
Marital status		
Single	16	4
Married	375	89
Separated	9	2
Widowed	20	5
Income		
Under ₦5,000	42	10
₦5,000-₦15,000	91	22
₦16,000-₦20,000	60	14
Above ₦20,000	97	23
No Response	130	31

Access and ownership of LLINs

Table 2 shows respondents' access to LLINs. A majority of the respondents (93.8%) had LLINs in their households. The respondents had one LLIN (6%), two LLINs (26%), three LLINs (20%), and four LLINs (20%). LLINs were accessed at the government hospitals (60%), mass campaign (30%), open market (6%) and project/NGO (4%).

Table 2 Access and ownership of LLINs by rural community members of Benue state (n=420).

Access/ownership	Frequency (n)	Percentage (%)
Does your household have any LLINs		
Yes	394	93.8
No	26	6.2
Number of LLINs per household		
1 LLIN	44	11
2 LLIN	114	27
3 LLIN	94	22
4 LLIN	94	22
5 LLIN	43	10
6 LLIN or more	31	8
Source of LLINs		
Government hospital	252	60
Mass campaign	126	30
Open market	25	6
Project/NGO	17	4

Usage of LLINs

Table 3 shows respondents' usage of LLINs. During the study, 91% of LLINs were hung properly upon a bed. Fourteen percent of did not sleep in an LLIN the night prior to this

survey and reasons for not using LLINs include; no mosquitoes (35%), too hot (31%), net users not around (19%) and don't like LLIN (2%). Sex of those who slept in their LLINs was male (75%) and female (25%).

Table 3 Usage of LLINs by rural community members of Benue state (n=420).

Usage of LLIN	Frequency (n)	Percentage (%)
Number of LLINs per household		
Seen	382	91
Not Seen	38	9
Did someone slept in LLIN last night		
Yes	361	86
No	59	14
Ages of those who slept under LLIN		
0-59 months	242	67
6-14 years	29	8
15-49 years	90	25
Reasons for not sleeping in LLIN		
Too hot	18	31
No mosquitoes	21	35
Net not hung	11	19
Net users not around	7	13
Don't like	2	2
Gender of those who slept in LLIN last night		
Male	270	75
Female	91	25

Discussion

This study determined the access and usage of LLINs by women of reproductive age and under five children in rural communities of Benue State. The study recorded more female (50.2%) respondents who were of the reproductive age and where married and living with their spouse. In the present study, 93.8% of the households had LLINs which were accessed majorly at the government hospitals (60%) and mass campaign (30%). Other sources include open market (6%) and project or NGO (4%). These findings are similar to that of Aderibigbe et al. [6] who recorded a coverage rate of 95.3% after a mass campaign in southwestern Nigeria. Similarly, in Kano State, coverage increased substantially to 70% after a mass campaign. Mbachu et al. [8] revealed in their study conducted in Anambra state that 81.1% households who had LLINs received the nets during the free distribution while 3.2% purchased theirs. A small proportion of the respondents had got their LLINs from relatives, friends or during election campaigns.

According to the national implementation guide for LLIN distribution, universal coverage translates to ownership of 2 LLINs per household and an assumption of five occupants per household [6]. This present study also recorded at least 2 LLINs per household (**Table 2**). In a similar study by Negash et al. [9] household ownership of ≥ 1 LLIN was 76.8% and 34.0% of households owned ≥ 2 LLINs. Eighty percent of all children less than five years of age and 68.5% of pregnant women were reported sleeping under a LLIN the previous night.

The present study showed that eighty six percent of the community members slept under an LLIN the previous night. This utilization rate is similar to findings by Animut et al. [10] conducted in a malaria prone area, the resultant mean utilization rate of LLINs based on the history of sleeping under nets in the previous night was 81.6% [11]. The present study also revealed that some community members don't use LLIN, reasons include; no mosquitoes, too hot, net users not around and don't like LLIN (**Table 3**). A study conducted in rural community in southwestern Nigeria by Adebayo et al. [12] revealed reasons for non-use of LLINs to include discomfort due to heat, difficulty in hanging up the nets and among the pregnant respondents some said they were waiting to deliver before they started using the nets as they felt it will be more beneficial to the newborn. Mbachu et al. [8] revealed that 64.4% of the households in Anambra state had members who had slept under their LLINs the previous night. Of those who had not used nets the previous night; 66% said it made them sweat, while 6.3% said LLIN is not a necessary preventive measure for malaria.

This study also revealed that majority of LLINs net users were under-five children. In a study by Negash et al. [9] majority of children under five (82.0%) and pregnant women (79.1%) had slept under an LLIN the night preceding the survey, however, use of LLINs by older children and adults was lower. In another study, use of LLINs by children less than five years of age and pregnant women was 94.6% and 88.7%, respectively [4]. The present study revealed that more male used LLINs compared to the female. However, this is in contrast to the findings of Garley et al. [13] which revealed that a higher percentage of females used ITNs compared to males (57.2% vs. 48.8%). Adolescent boys remained the least likely group to use an ITN.

Conclusion

This study has generated information on access and usage of LLIN in rural communities of Benue State, Nigeria. The study revealed LLIN high coverage and utilization rate; however, regular usage among the female population was low. Hence, advocacy on bed-net usage should be focused on women of child bearing age. Use of LLIN for under-five children should also be encouraged at all levels to reduce child mortality due to malaria.

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