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## **An assessment of malaria control and prevention interventions in Jos North and South, North-Central Nigeria**

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### **ABSTRACT**

The goal of Malaria control and prevention is to prevent mortality, reduce morbidity, social and economic losses. This study sought to assess the level of Malaria control interventions currently in place in Jos North and South, North-Central, Nigeria. A cross sectional study was carried out on 150 respondents, 122 from households and 48 from two Antenatal Clinics, ANC, each from both local governments. A total of 801 individuals and an average of 6 persons per household were covered using pretested questionnaires which were administered to household heads, pregnant women and mothers of children under 5 years. The sampled population was recruited by purposive sampling. The response rate was 95%. Descriptive statistics was employed for the analysis of the questionnaires. Findings revealed that out of 269 Insecticide-Treated Nets (ITNs) or bed nets available, 161 (60%) were received free and 108 (40%) were bought. Also, 68 (25%) of these nets were not put to use while 201 (75%) were in use. Ratio of persons to net was 4:1 (practically), 3:1 (theoretically). Reasons for poor coverage, acceptance and utilization of bed nets were: availability- 95 (32%), high cost- 81 (28%), hot weather- 40 (14%), unfashionable- 17 (6%) and other reasons 59 (20%). Risk groups that slept under bed nets were: 96 (51%) under 5 years; 23 (48%) pregnant women and those that did not were 91 (49%) children under-5 years and 25 (52%) pregnant women. A total of 48 women required ANC and there was a 100% attendance at ANC with 37 (77%) pregnant women had two or more doses of IPT-SP. The findings above revealed lower bed net coverage levels compared to the set targets of 80% for risk groups and a ratio of 2:1 persons to a net. This calls for increased level of information and enlightenment to community members as well as health system support.

**Keywords:** Malaria Control and Prevention, ITNs.



### **INTRODUCTION**

An increasing global prioritization of malaria control has led to the establishment of two global initiatives to assist resource-constrained countries to control malaria and other endemic diseases: the World Health Organization's (WHO) Roll Back Malaria partnership (alongside with UNICEF, UNDP, World Bank and WHO) and the Global Fund for AIDS, TB and Malaria[1]. Since the launch of the Roll Back Malaria (RBM) initiative in Nigeria, several control activities under the major strategic interventions have been implemented[2]. Findings from evaluation survey carried out in Nigeria to assess progress in the early years of the RBMs existence showed slow progress towards set targets[2]. The specific findings from this survey showed that less than 80% of

households used ITNs in addition to less than 80% of coverage in children less than 5 years of age and pregnant women. This, however, was in part due to tremendous challenges which the RBM partnership faced during that period. The main challenges were: resistance of malaria parasites to drugs, Non-availability of the relative new and effective anti-malarial commodities such as Artemisinin- based Combination Therapies (ACTs) for treatment as well as Insecticide Treated Nets (ITNs) for prevention and limited resources to scale up these proven interventions to all Nigerians[2].

In very recent years, however, the country has been exploring opportunities for rapid progress in the area of Malaria Control and Prevention through the use of the Integrated Vector Management (IVM) and the newer version, Long-Lasting Insecticide

Nets (LLINs) as well as the Affordable Medicines for Malaria (ACTs). In the Strategic Plan 2009-2013 of the Federal Ministry of Health, National Malaria Control Programme, Abuja, Nigeria, it is hoped that "Malaria will no longer be a major public health problem in Nigeria as illness and death from malaria are dramatically reduced and families will have universal access to malaria prevention as well as treatment. Going by this plan, it is expected that 80% of households with two or more ITNs/LLINs (one net to two people) by 2010 and sustained at this level until 2013; at least 80% of children less than 5 years of age and currently pregnant women sleeping under ITN by 2010 and sustain coverage thereafter; at least 80% of pregnant women attending Ante-Natal Care (ANC) services and 50% of all pregnant receive at least two doses of Intermittent Preventive Treatment (IPT) by 2010 and these rates increase by 2013 to 100% and 75% respectively[2]. Some studies have shown low levels of coverage, access and utilization of malaria interventions in some communities in Nigeria[3-4].

The reasons people do or do not use their nets, as well as the factors affecting net ownership are very important for effective malaria control and prevention programmes. These reasons/factors have been reported as: nets being used to reduce nuisance biting, tendency to sleep outside nets in hot weather, lack of knowledge on malaria transmission[5-7]. Qualitative data on usage shows that nets are used in part to prevent malaria, but importantly mainly to reduce nuisance biting, most of which is by mosquitoes which do not transmit malaria[5]. Other factors such as season (with lower use when it is hot) are also important[6]. It was also reported that many folk beliefs about malaria transmission e.g. that malaria transmission occurs through flies or via breast milk, can undermine the rationale for net usage[7]. Net usage is in principle a more useful measure than net distribution as it has a more meaningful direct link with impact, but is more difficult to measure. If there are fewer nets per household than people, there is a theoretical risk that the most vulnerable groups (infants, young children and pregnant women) may remain unprotected[8-9]. There are possible explanations for ITNs/LLINs low coverage. These include: poverty and affordability problems, people may not value nets enough to buy them, availability problems and some people may not know where they can buy one. There has been protracted debate between those who believe strongly ITNs should be distributed free and those who promote subsidy-based methods or vouchers linked to social marketing[10-11]. The WHO's position is that rapid scale-up of LLINs coverage can best be achieved through free or highly

subsidized distribution through existing public health services (both routine and campaigns). A recent systematic review concluded that when continuous distribution involved the commercial sector alone, increases in coverage rates ranged from 3% to 5% per year, whereas combining the commercial market with the distribution of free or highly subsidized nets through routine services achieved increases in the range 6% to 25%[12]. Even though there are pockets of studies on Malaria prevention and control in Africa and across Nigerian communities, there was none found from literature search in this study setting. Furthermore, it is intended that the outcome of this study would be beneficial to all stakeholders in the fight against malaria in Nigeria and beyond. The aim of this study is to assess the level of effective malaria control interventions in place in the study setting as well as making recommendations and proposing implementation strategies for maximal coverage and usage.

## MATERIALS AND METHODS

**Study Setting:** The study was conducted in Jos, North-Central Nigeria. Five selected communities from Jos North and South Local Government Areas (LGAs) namely: Kwata, Trade Center, National Institute staff quarters, Kuru, ANC at the National Institute Medical Center, Kuru and the Prevention of Mother to Child Transmission (PMTCT) clinic of the APIN-PEPFAR center, Jos, participated in the study. The study communities and centers were selected by convenience. The communities are fairly rural as they are not communities within Jos town. The two study ANCs used are from each local governments. The convenience method of study location is very timely bearing in mind the insurgencies and security challenge prevalent in Jos at the time of the study. One limitation of the convenient method of selecting study population is that the findings from the study may not be easily generalized to other study populations or settings not covered by the study.

**Study Design:** A descriptive, cross-sectional survey was carried out on 150 respondents; 122 from households and 48 from two ANCs each from both LGAs. Informed consent for the study was sought from the participants. Primary data were collected through pretested questionnaires which were adopted from the 2010 LGAs survey of the National Malaria Control Programme booster project[13]. Purposive sampling of respondents was adopted. This was done by a skipping or alternate pattern of selection of the households sampled. This sampling method was also adopted for the ANCs where the questionnaires were administered.

Inclusion criteria: household heads who are 20 years and above, pregnant women who are 16 to 36 weeks of gestation and also mothers of children under -5 years. Exclusion criteria: pregnant women of gestational age less than 16 weeks or greater than 36 weeks.

**Data Analysis:** Descriptive statistics was employed for the data analysis and these include: frequencies, graphs, charts and histogram and results presented using tables, graphs and charts.

## RESULTS

Table 1 below showed that out of 150 questionnaires that were distributed, 142 representing 95% were retrieved. 8 questionnaires were not retrieved and this was about 5% of the total.

**Table 1: Analysis of Response rate**

Questionnaire	Frequency	Percentage
Retrieved	142	95
Not Retrieved	8	5
<b>Total Distribution</b>	150	100

**Table 2: Household size, nets available and in use.**

Table 2 is a cumulative of the total number of persons in all sampled households (HS), under-5 years children (U – 5), number of nets in all household (NN), number of nets in use in all (NNU) and number of unused nets (NUN). Very important deductions here include:

Ratio of persons (HS): Number of Nets in use (NNU) = 4:1, meaning 4 persons are sharing one (1) net (practically).

Ratio of persons (HS): Number of Nets available (NN) = 3: 1, theoretically, 3 persons are to share one (1) net. The number of children under-5 years was 187(23%) while pregnant women/mothers of U-5 was 48 (6%). A total of 67 (25%) of the nets available in these households were not put to use.

Variables	Frequency
Household Size (HS)	801
Under -5 years (U-5)	187
Number of Nets (NN)	269
Number of Nets in Use (NNU)	202
Number of unused Net (NUN)	67
Number of Pregnant women	48

Ratio of persons: bed nets = 3: 1

Ratio of persons: bed nets in use = 4: 1

**Table 3: Reasons for Poor Coverage, acceptance and utilization of bed nets**

Respondents' reasons for poor coverage, acceptance and utilization of bed nets were: Availability 95 (32%), High Cost 81 (28%), Hot weather 40 (14%), Unfashionable 17( 6%) and Other reasons 59 (20%).

Reasons	Frequency	Percentage
Availability	95	32
High Cost	81	28
Hot weather	40	14
Unfashionable	17	6
Others	59	20
<b>Total</b>	292	100

**Table 4: Percentage coverage of risk groups**

The table below revealed that 96 (51%) of the children slept under bed nets while about 91 (49%) of them did not. This implies that an average of the children's population is exposed to the dangers of malaria infection. Further to this, they may account for the number of children absent from school and may bring socio-economic burden on their families. Findings from the table also revealed that 23 (48%) pregnant women slept under bed nets while 25 (52%) did not.

Risk Groups	Frequency	Percentage
Number of Pregnant women sleeping under net (P-SUN)	23	48
Number of Pregnant women sleeping outside net (P-SON)	25	52
Number of Under -5 sleeping under net (U-5 SUN)	96	51
Number of Under -5 sleeping outside net (U-5 SON)	91	49

**Table 5: Sources of Bed nets**

The table below revealed that more of the bed nets in the households were received free (60%) compared to those that were bought (40%).

Source	Frequency	Percentage
Free through campaigns	29	60
Bought from Shops	19	40
Total	48	100

**Table 5: Number of SP doses taken**

A total of 48 pregnant women participated in the study. Out of this, 1 (31%) had 2 doses of IPT – SP, 13 (27%) had 3 doses while 11(23%) said that they had only one dose of IPT – SP during pregnancy. The number of respondents who had greater than 3 doses of IPT – SP stands at 9 (19%). From this survey, 37 (77%) had a minimum of 2 doses of IPT- SP which is acceptable. The remaining 11 (23%) who had one IPT-SP may have had less due to health systems factors (poor service delivery) or patient factors (affordability, adherence).

Number of Doses	Frequency	Percentage
1	11	23
2	15	31
3	13	27
>3	9	19
Total	48	100

## DISCUSSION

The reasons for non-utilization of bed nets are as important as those for poor coverage. The Roll Back Malaria target is a ratio of two persons to one net in use. The study revealed that the bed net coverage as seen above was below the target set. Further to this, the majority of the respondents have pegged the reasons for poor coverage, acceptance and utilization of bed nets on availability, high cost, hot weather, people do not value bed nets enough to buy them, some did not know where to buy one from, some cannot mount the net, and some feel lazy to lower the net at night. Related studies reported bed net coverage levels lower than 80% [12,9]. Similarly, hot weather and other folk beliefs were some of the reasons for poor acceptance and utilization of bed nets [5-6]. However, some households are still waiting for free bed net distribution. The free net dominance may suggest that more households who do not have bed

nets are still waiting for the next free bed net distribution. There is a strong advocacy for free bed nets distribution [7, 11]. It is evident that there is still a high demand for free bed net distribution as the respondents' kept asking if this study would be accompanied by a free bed net distribution.

On the average, pregnant women 23(48%) and children 96(51%) slept under bed nets although still less than 80% coverage. This leaves a window of opportunity for malaria infections in vulnerable groups of the sampled communities. This will leave us with very poor maternal and infant health indices. The end result will be anaemia, low birth weights, mortality, and miscarriages. The majority of the pregnant women 37 (77%) had a minimum of two doses of IPT–SP coverage which is commendable. More than the average population of these women had a minimum of two doses of IPT-SP.

While the interventions above are laudable, the study revealed that there are challenges in the area of diagnoses and treatment services rendered by the health facilities; willingness to use bed nets in the general populace and risk groups. It is worthy of mention that this study was carried out in two LGAs (Jos North and South) which are the most cosmopolitan in Plateau state, Nigeria. The findings from this study may differ from those of the other rural LGAs.

#### LIMITATIONS OF THE STUDY

This study was conducted in the most urban LGAs within the state and may not be representative of the entire state or country. The extent to which the findings can be readily generalized is open to debate. Notwithstanding, the validity and reliability of the position taken in this study should not be undermined. In addition, the study has been

constrained by time and the scope has been limited. Substantial data on bed net usage can be more realistic if data collection is carried out post free net distribution accompanied by bed net usage education. In addition, the convenience sampling method used is also a limitation to the generalizability of the study.

#### CONCLUSION

The findings from this study revealed that the households sampled are yet to meet the minimum 80% coverage for population at risk (children under 5 years, pregnant women, people living with HIV/AIDS) sleeping under net and the ratio 2:1, persons to a net. Considering the above, there is a disparity from what is expected, thus the need to close this gap by adequate information, enlightenment as well as health system support.

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