

## THE EFFECTIVENESS OF INSECTICIDE TREATED NET (ITN) IN THE CONTROL OF MALARIA.

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### ABSTRACT

Studies on the effectiveness of the use of Insecticide Treated Net (ITN) in the control of malaria was carried out in hospitals in Ekiti State. A total of 2,000 questionnaire were administered and 1,977 copies of these questionnaire were returned by the respondents. Of the 1,977 questionnaire collected, 176 respondents representing 8.9% confirmed the effectiveness of ITN in the control of malaria. Female has the highest prevalence of malaria with 71.9% while the male has the least prevalence of malaria with 28.1%. There was a significant difference ( $t = 2.17$ ;  $P < 0.05$ ) in the percentage prevalence of malaria between males and females. However, there was no significant difference ( $t = 1.07$ ;  $P > 0.05$ ) between frequency of use of ITN in once and twice a year among the patients. Of the sixteen Local Government Areas sampled, Ado-Ekiti Local Government Area has the highest percentage 22(17.6%) distribution of ITN while Ise and Ilejemeje Local Government Areas have the least percentage 5(4%) distribution of ITN. Low use of ITN was widely reported by the respondents.

**KEY WORDS:** Insecticide Treated Net (ITN), Hospital(s), patients, malaria and questionnaire.

### INTRODUCTION

Malaria is a wide spread disease and it is of important public health concern in Nigeria because of its impact on children and maternal health (Orimadegun, *et al.*, 2007). Malaria is the cause of 11% maternal deaths, 60% of out-patient visits and 30% of hospitalizations in the country are malaria related cases (Adewole, 2009). In addition, malaria is said to kill one African whether child or adult every 15 seconds and roughly 300,000 Nigerian children annually (Salako, 2006). People who live below the poverty line, children under five years of age (22% of population) and pregnant women (20% of population) are the most vulnerable to malaria disease even where some degree of acquired immunity in areas of intense transmission for most adult population is offered (Adewole, 2010). Malaria is truly a disease of poverty afflicting primarily the poor who tend to live in malaria-prone rural area in poorly – constructed dwellings that offer few, if any barriers against mosquitoes.

However, despite malaria resistance to drugs, it is both preventable and treatable. An effective and curative tools have been developed and that is Insecticide Treated Net (ITN). Insecticide Treated Net is a mosquito net which repels, disables and/or kills mosquitoes when they come in contact with insecticide on the netting material. ITN offers protection against mosquitoes, flies and other insects, and thus against diseases such as malaria, dengue fever and various forms of encephalitis (Guillet, *et al.*, 2005). There are two categories of ITNs namely conventional treated nets which is a mosquito net that has been treated by dipping the net in a World Health Organisation (WHO) recommended insecticide and long-lasting insecticidal nets – which is a factory treated mosquito net made with netting materials that has insecticide incorporated within or bound around the fibres. The dearth of information on the effective use of ITNs in malaria control in this part of the country occasioned this study.

### MATERIALS AND METHODS

**Study Area:** The study was carried out in various hospitals situated in the 16 Local Government Areas of Ekiti State. Ekiti State is located between latitude  $7^{\circ} 15'$  and  $8^{\circ} 5'$  N and longitude  $4^{\circ} 5'$  and  $5^{\circ} 45'$  E. The 16 Local Government Areas are Ado, Ikere, Efon, Ekiti-West, Ekiti South-West, Ijero, Ido-Osi, Moba, Ilejemeje, Ikole, Ekiti-East, Gbonyin, Emure, Ise-Orun, Oye and Irepodun-Ifelodun. The rainy season usually starts in April and ends in October with a short break in August, but there exist a considerable variations in the rainfall pattern from year to year. The Local Government Areas are characterized with extensive trees; inhabitants are mainly farmers, civil servant, petty traders with few migrant labourers.

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**Data Collection:** Quantitative data on the use of Insecticide Treated Net among patients in hospitals were collected using questionnaire. A total of 2,000 questionnaire were administered. 125 copies were distributed to each Local Government, out of which 1,977 copies of the questionnaire were properly filled and returned by the patients/respondents. Details obtained include sex, last time the patients have malaria, how often the patients have experience malaria before and after using the net. Information was also obtained concerning whether or not the patient used insecticide treated net at all, causes of malaria and whether malaria can be treated, prevented and control. Data were analysed using descriptive and inferential statistics.

## RESULTS

The result of the effective use of insecticide treated net in the control of malaria revealed that of the 1,977 questionnaire collected from the respondents, 176 patients representing 8.9% confirmed the effectiveness. In all the 16 Local Government Areas sampled, Ado-Ekiti has the highest percentage 22(17.6%) distribution of ITN while Ise and Ilejemeje Local Government Areas have the least percentage 5(4%) distribution of ITN (Table 1).

**Table 1: Distribution of Insecticide Treated Net (ITN) in Ekiti State**

S/N	NAME OF LOCAL GOVERNMENT AREAS	NUMBER AND %
1.	Ikole	17 (13.6%)
2.	Ado	22 (17.6%)
3.	Ijero	21(1.68%)
4.	Ikere	15(12.5%)
5.	Ekiti West	16(12.8%)
6.	Efon	14(11.5%)
7.	Gbonyin	6(4.8%)
8.	Emure	7(5.6%)
9.	Moba	8(6.7%)
10.	Oye	6(4.9%)
11.	Ido-Osi	7(5.6%)
12.	Ekit South West	9(7.4%)
13.	Ise	5(4%)
14.	Ilejemeje	5(4%)
15.	Ekiti East	11(9.1%)
16.	Irepodun-Ifelodun	7(5.6%)

The occurrence of malaria before using ITN was highest at Ilejemeje Local government Area with 60% percentage prevalence while the least occurrence of malaria before using ITN was recorded in Ikole Local Government Area with 17.6% percentage prevalence. Also, the highest percentage prevalence of 19% was recorded in Ijero after while the least percentage prevalence of 4.2% was recorded in Efon after using ITN.

The frequency of malaria before using ITNs was highest in Moba with 62.5% while the least percentage of 17.6% was recorded in Ikole before the use of ITNs (Table 2).

**Table 2: Frequency of Malaria before Using Insecticide Treated Net (ITN)**

Location	Once a year	Twice a year	3 times a year	4 times a year	Frequently	Total
Ikole	3(17.6%)	3(17.6%)	5(9.4%)	6(35.3%)	-	100%
Ado	6(27.2%)	4(18.2%)	8(36.4%)	4(18.2%)	-	100%
Ijero	6(28.6%)	3(14.3%)	5(23.8%)	7(33.3%)	-	100%
Ikere	4(26.7%)	5(33.3%)	6(40%)	-	-	100%
Ekiti West	5(31.3%)	3(18.8%)	6(37.5%)	2(12.5%)	-	100%
Efon	3(21.4%)	6(42.9%)	4(28.6%)	1(7.1)	-	100%
Gbonyin	3(50%)	2(33.3%)	1(16.7%)	-	-	100%
Emure	3(42.9%)	2(28.6%)	2(28.5%)	-	-	100%
Moba	5(62.5%)	2(25%)	1(12.5%)	-	-	100%
Oye	3(50%)	2(33.3%)	1(16.7%)	-	-	100%
Ido-Osi	3(42.8%)	2(28.6%)	2(28.6%)	-	-	100%
Ekiti South West	4(44.4%)	4(44.4%)	1(11.1%)	-	-	100%
Ise	3(60%)	2(1.6%)	-	-	-	100%
Ilejemeje	3(60%)	2(40%)	-	-	-	100%
Irepodun/Ifelodun	4(57.1%)	2(28.6%)	1(14.3%)	-	-	100%
Ekiti East	5(45.5%)	2(18.2%)	3(27.3%)	1(9.0%)	-	100%

The frequency of malaria was highest in Emure with 71.4% and the least frequency of 3.2% was recorded in Ise (Table 3) after using insecticide treated net.

Female has the highest prevalence of malaria with 71.9% while the least prevalence of malaria with 28.1% was recorded in male. There was a significant difference ( $t = 2.17$ ;  $P < 0.05$ ) in the percentage prevalence of malaria between males and females. However, there was no significant difference ( $t = 1.07$ ;  $P > 0.05$ ) between frequency of use of ITN in once and twice a year among the patients.

**Table 3: Frequency of Malaria after using Insecticide Treated Net (ITN)**

Location	Once a year	Twice a year	Three time a year	Total
Ikole	7(41.2%)	7(41.2%)	3(17.6%)	100%
Ado	9(40.9%)	8(36.4%)	5(22.7%)	100%
Ijero	8(38.1%)	9(42.9%)	4(19.0%)	100%
Ikere	6(40%)	8(53.3%)	1(6.7%)	100%
Ekiti West	8(50%)	6(37.5%)	2(12.5%)	100%
Efon	6(42.9%)	6(42.9%)	2(4.2%)	100%
Gbonyin	4(66.7%)	2(33.3%)	-	100%
Emure	5(71.4%)	2(28.6%)	-	100%
Moba	5(62.5%)	3(37.5%)	-	100%
Oye	4(66.7%)	2(33.3%)	-	100%
Ido-Osi	3(57.1%)	4(42.9%)	-	100%
Ekiti South West	6(66.7%)	3(33.3%)	-	100%
Ise	4(3.2%)	1(2.0%)	-	100%
Ilejemeje	3(60%)	2(40%)	-	100%
Irepodun/Ifelodun	4(57.1%)	3(42.9%)	-	100%
Ekiti East	5(45.5%)	6(54.5%)	-	100%

## DISCUSSION

Mosquito nets are often used where malaria or other insect borne diseases are common, especially as a tent like covering over a bed. Mosquito netting can be hung over beds, from the ceiling or a frame, built into tents or installed in windows and doors. When hung over beds, rectangular nets provide more room for sleeping without the danger of netting contacting skin (Miller, *et al*, 2007). The use of insecticide treated net in Ekiti State was low especially in Ise and Ilejemeje which have the least distributions of ITN. Factors that may contribute to the low use of insecticide treated net in Ekiti State may be due to illiteracy on the part of the patients who felt that the treated bed net is not necessary thereby contributing to the low use of insecticide treated net. It may also be due to the fact that patients were unable to afford bed due to economic meltdown and hence, high risk of prolific mosquito bites. The implication of that is that there would be no place to hang the net hence resulted to low patronage and high infection. Another factor that may contributed to the low use of insecticide treated net was probably due to the fact that some patients used alternatives such as insecticide prays, mosquito repellants and mosquito coils. These alternatives demand some daily procedures that may initially produce an uncondusive environment for the mosquitoes and people (Jones, 2008). But all that is required for treated net is for user to slip in and out from under the nets on a daily basis or as required, so insecticides treated nets are effective (W.H.O, 2007).

However, despite the fact that there was low use of insecticide treated net in Ekiti State, the treated net was still effective as reported by the patients because before the respondents started using insecticide treated net, the rate at which they fell sick was high but reduced drastically after the use of insecticide treated net (ITN). This may be due to the fact that insecticide treated nets have the advantage of providing a physical and chemical barrier to the malaria vector (Jones, 2008). The low use of insecticide treated net (8.9%) recorded in this study is comparable to those of a marketing survey in Nigeria where 10% of 5,000 households owned at least one net and Mozambique, where only 3% of people heard about insecticide treated net and 9% used treated or ordinary net (W.H.O, 2007). Also, the results of low use of insecticide treated nets obtained in this study was similar to a survey carried out in Nigerian rural villages where the acquisition and usage of untreated mosquito nets was low and nil for ITNs and very few people heard about the use of insecticide treated net (Obinna, 2009). The present study showed that more females respond to questionnaire than their males counterparts because females e.g pregnant women and mothers who accompany their children or their relatives to the hospitals, hence more response to questionnaire and higher infections in females than males. In order to circumvent these problems, the Ministry of Health and

other relevant authorities need to sensitize the entire populace the importance and use of the treated nets through the mass media and other means of communication.

#### REFERENCES

1. Adewole, S.O. (2009). The influence of environmental and ecological Factors in the transmission of malaria. *Journal of Research in Science and Management*, 7(1): 57-62.
2. Adewole, S.O. (2010). Prevalence of malaria in Children, adults and pregnant women in Akure, Nigeria. *International Journal of Biological Science*, 1(3): 185-190.
3. Guillet, P.A; Alniwick, M.K; Naira, M.C and Heymann, D (2005). Long-lasting treated mosquito nets. A breakthrough in malaria prevention. *Bull. of World Health Organisation*, 97(10): 993-998.
4. Jones, C (2008). Bed nets and malaria. Use of insecticide treated nets in Inharrime and Zavala Districts, Mozambique. *African Journal of Science*, 25: 22-26.
5. Miller, J.K; El-Nahlen, B.L and Steketee, R (2007): Estimating the number of insecticide treated nets required by Nigerian households to reach continent – wide malaria coverage targets. *Jama*, 50: 224-229.
6. Obinna, O (2009). Increasing coverage of insecticide treated nets in rural areas of Nigeria. Implications of consumer knowledge, preferences and expenditure for malaria prevention. *Journal of parasitology*, 16: 12-19.
7. Orimadegun, A.E; Fawole, O; Okereke, J.O; Akinbami, F.O and Sodeinde, O (2007). Increasing burden of childhood severe malaria in a Nigerian tertiary hospital: Implications for control. *J.Trop. Pediatr*, 53: 185-189.
8. Salako, L.A (2006): National malaria day awareness week: A text of address given on the occasion of the malaria awareness day held in Abuja. *J.Mal. Trop. Afr*: 1: 6-7.
9. World Health Organisation (2007). Malaria control programme: Position statement of insecticide treated nets. 65: 22-27.