

**FACTORS AFFECTING PROPER AND REGULAR USE OF INSECTICIDE TREATED
NETS (ITNs) AMONG SLUM DWELLERS IN KAMPALA: A case study of
Katanga and Kivulu Slums**

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DECLARATION

I, Kasule Joseylee Surmey, hereby declare that this dissertation is my original work and has never been submitted to any University or institution of higher learning for the award of any academic qualification.

Signed:

Date:

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APPROVAL

This work has been produced under my supervision and submitted for examination with my approval.

Signed:

Date:

PROF. NDUNGUTSE DAVID

DEDICATION

I dedicate this book to my beloved parents Mr. Mpoza Augustine and Mrs. Nabadda Sylvia, brothers, sisters and relatives.

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The odious work for this research received blessings and contributions from people to whom I am greatly indebted.

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ACRONYMS AND ABBREVIATIONS

ACRONYMS

ITNs: Insecticide Treated Nets

LC: Local council

WHO: World Health organization

PMI: Presidential Malaria initiative

LLINs: Long lasting Insecticide Nets

ANC: Antenatal care

GoU: Government of Uganda

HIV: Human Immuno Virus

AIDS: Acquired Immune Deficiency Syndrome

NMCP: National Malaria Control Programme

MOH: Ministry of Health

OPERATIONAL DEFINITIONS

Household: A household is defined as a group of people living within one domicile who normally share meals together.

Insecticide Treated Mosquito Nets: Nets treated with insecticide to kill or irritate mosquitoes and used as physical barriers.

Proper ITN Use: The use of standardized ITNs with no holes, properly hanged (mounted) over the bed or sleeping area.

Regular ITN Use: Sleeping under an Insecticide Treated Net every night

ITN in good state: ITN without any hole in it

ITN in bad state: ITN with holes in it

An adult: Any household member above 18years of age.

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ABSTRACT

Background: Malaria is a major public health problem affecting people, with 107 countries having areas at risk of transmission containing close to 50 percent of the world's population. In Uganda malaria is the most common disease and a leading cause of mortality. Since 2006, the Uganda Ministry of Health together with Non Governmental Organizations have promoted and donated ITNs to vulnerable groups of people but the malaria occurrence has remained prevalent among slum dwellers of Kampala and no study has been done on the factors influencing proper and regular use of ITNs among these dwellers.

Main objective: To investigate factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers of Katanga and Kivulu in Kampala.

Methodology: A census of 289 households which had at least one ITN was conducted in Katanga and Kivulu slums. The household heads were asked whether they possessed at least one ITN in the house in order to include or exclude the household. A questionnaire that had questions on socio-demographic characteristics, knowledge and practice of the respondents on ITNs was administered. An observation of state of ITNs was done for the households that owned them. Univariate, bivariate and Multivariate logistic regression statistical analyses were used in the study.

Results: Of 289 surveyed households, 109 (37.7%) were proper ITN users compared to the 180 (62.3%) improper ITN users. Out of the 289 respondents 187 (64.7%) reported to be regular ITN users compared to the 102 (35.3%) irregular ITN users. Most of ITNs that were being used had holes 180 (62.3%) and this was considered improper use while 109 (37.7%) nets had no holes. The high proportion of torn ITNs suggests there is very limited protection against mosquito bites

at night and therefore a high risk of malaria transmission. The problems reported for improper and irregular use include; ITNs causing excessive heat, suffocation, discomfort and itching, insufficient nets, inadequate space, difficulty in hanging the net, torn ITNs, size and shape of ITNs.

At a bivariate analysis, Gender was associated with irregular use of ITNs ($P=0.017$), problems like ITNs causing itching and discomfort had significant association with improper use ($P=0.023$). At bivariate and multivariate level of analysis, the rest of the variables such as age, education level, occupation, marital status, heat and suffocation caused by sleeping under ITNs were found to have no significant relationship with both proper and regular use of ITNs ($P>0.05$). Despite the fact that respondents had a high knowledge on; how malaria is transmitted at 91%, how malaria is prevented at 88.9%, how ITNs prevent malaria at 96.5% and how frequent to use ITNs at 94.8%, they were still improperly and irregularly using ITNs.

Conclusion: Reported and observed factors such as torn ITNs, insufficient ITNs, inadequate living space, shape and size of the ITNs, difficulty in hanging the net, excessive heat, itching and discomfort caused by sleeping under a mosquito net, have contributed to improper and irregular use of ITNs in Katanga and Kivulu slums and this explains the increasing malaria incidences in these areas.

Therefore, KCCA, donor projects, organizations together with the Ministry of Health should frequently educate slum dwellers on how to properly and regularly use ITNs if success in reducing malaria related morbidity and mortality is to be registered in Kampala slums.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Malaria is a major public health problem affecting people, with 107 countries having areas at risk of transmission containing close to 50 percent of the world's population (Hay et al 2004; WHO 2005). More than 3 billion people live in malarious areas and the disease causes between 1 million to 3 million deaths each year (Snow et al 2003). In addition, almost 5 billion clinical episodes resembling malaria occur in endemic areas annually, with more than 90 percent of this burden occurring in Africa (Mills 2004, Breman 2001).

Malaria-related illness kills at least one million people each year, and most of these deaths are among African children and pregnant mothers. Nearly 500 million people suffer a malaria episode every year. Despite decades of effort to combat it, malaria continues to account for 20 per cent of under-fives mortality in Africa and constitutes 10 per cent of the continent's overall disease burden. Malaria also has severe negative effects on maternal health and birth outcomes. Malaria can be treated, controlled or even eliminated using the available methods. Results from Randomized controlled trials in Africa of different transmission intensities have shown that Insecticide Treated Nets (ITNs) can reduce the number of under 5 deaths by around one-fifth (Lengeler, 2001) saving about 6 lives for every 1000 children aged 1-59 months protected each year by using ITNs. The incidence of clinical episodes of plasmodium falciparum infection is reduced by 50 percent on average. When used by pregnant women, ITNs are also efficacious in reducing maternal anemia, placental infection and low birth weight, (Garner and Gulmezoglu 2000)

Insecticide-treated bed nets (ITNs) form the major tools at our disposal for reducing malaria morbidity and mortality among pregnant mothers and children under five years. In Uganda, malaria is the most common disease and kills the most people (Batega, 2004; Malaria Control Programme, 2005). It is the most frequent cause of attendance at health facilities accounting for 25 – 40% of out-patient attendances, 20% of in-patient admissions and 9 – 14% of in-patient deaths. Children aged five years and below, and pregnant women are the most affected; more than 200 children die daily from the disease (Malaria Control Programme, 2005; Ministry of Health, 2006).

The deployment of ITNs in Uganda began in the early 1990s as pilot projects by NGOs. Since then, their use increased as a result of the creation of a favorable policy and institutional environment: ITNs became a governmental policy for malaria vector control for the first time in 1998. By 1999, taxes and tariffs on ITNs and netting materials had been removed by the government.

Since 2006, Presidential Malaria Initiative has procured and distributed 2.2 million Long Lasting Insecticide Nets to pregnant women and children under five years of age through mass campaigns, antenatal care (ANC) clinics, nongovernmental and community-based organizations. President's malaria initiative has simultaneously promoted consistent and correct use of Long Lasting Insecticide nets; early evidence suggests that high usage of Long Lasting Insecticide nets is being achieved (PMI Uganda FY 2009). The GOU continues to distribute free mosquito nets especially to children under five years, pregnant mothers, people living with HIV/AIDS and populations in emergencies.

1.2 Background to the study area

Katanga and Kivulu were previously swampy areas found in Kawempe division, Kampala the capital city of Uganda. These areas were not meant for human habitation ("Green Belts"). Katanga has got a total of 2000 households and Kivulu has 500 households. Human habitation in these areas is forced by poverty arising out of rural-urban migration. These areas hardly have any suitable sanitation-related infrastructure in place. Houses are very close together with limited access by vehicles (e.g. cesspool emptier). Piped water supply is not universal; water borne sanitation is not available with poor drainage systems in place. Being reclaimed swampy areas, the shallow heavily shared pit latrine easily pollute the water sources such as protected springs which a very big proportion of the population use, since they do not have access to the piped water infrastructure (KCC, 2000:).

Most of the slum houses are predominantly single rooms commonly known as "mizigo", a local description of a tenement house. These structures are built in such a way that there is virtually no space between them. Infectious diseases especially water related and air borne are prevalent in these slum areas.

1.3 Scope of the study

The study was carried out in Katanga and Kivulu slums found in Kawempe division, Kampala district. In this study, we interviewed any adult in the household, which household possessed an Insecticide Treated Net, and the study specifically investigated factors that affected proper and regular use of Insecticide Treated Nets. The study was carried out between July and August 2011.

1.4 Statement of the problem

Malaria contributes a major share of the disease burden in the country, with 39% outpatient visits and 35% of inpatient admissions due to malaria, (CDC 2006). In Kampala, malaria is presently the leading cause of morbidity, mortality and absenteeism in schools and work places, (Uganda Ministry of Health, unpublished data). Kampala slums like Katanga and Kivulu are characterized by poor sanitation and drainage systems, surrounded by stagnant pools of water, flooding during the rainy seasons and are located in low land areas which were previously swamps which are breeding places for mosquitoes. This predisposes slum dwellers to mosquito bites leading to high malaria incidences, (Slum Aid Project 2000).

ITN use is one of the most recommended malaria control measure by the Ministry of Health and since 2010, Cerebral Malaria Project in Mulago Hospital has been providing ITNs to slum dwellers of Katanga, Kivulu, Kamwokya, Kifumbira and other Mulago suburbs. In early 2010, volunteers from 'Forever Living Products Uganda', a non-governmental organization together with the Ministry of Health moved to slum areas of Katanga and Kivulu donating free Insecticide Treated Nets as a way of preventing Malaria among urban slum dwellers, (Uganda Ministry of Health, unpublished data).

Despite all these efforts of malaria prevention through ITN promotion, slum dwellers of Katanga and Kivulu still report more incidences of malaria to Cerebral Malaria Project than other areas that were provided with ITNs. There is insufficient information however that point to factors affecting proper and regular use of Insecticide Treated Nets among urban slum dwellers.

The knowledge of such factors will help reform the intervention to more appropriately prevent and control malaria transmission in these slums in Kampala.

It was against this background therefore, that this study aimed at investigating factors affecting proper and regular use of Insecticide Treated Nets among urban slum dwellers of Katanga and Kivulu.

1.5 Objectives of the study

1.5.1 Main objective

The main objective of the study was to investigate factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers in Katanga and Kivulu. The study was intended to add knowledge to the Uganda's comprehensive malaria control program on how to improve on service delivery and also address factors that affect proper and regular use of Insecticide Treated Nets (ITNs) among urban slum dwellers.

1.5.2 Specific objectives

1. To investigate factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers of Katanga and Kivulu.
2. To assess people's knowledge of malaria transmission and prevention in the slum areas
3. To investigate the state of ITNs used by slum dwellers.
4. To establish the proportion of households using Insecticide Treated Nets in Katanga and Kivulu.
5. To investigate the way slum dwellers of Katanga and Kivulu use Insecticide treated Nets.

1.6 Research Questions

1. What are the factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers of Katanga and Kivulu?
2. What is the peoples' knowledge of malaria transmission and prevention in the slum areas?
3. What is the proportion of torn ITNs being used in Katanga and Kivulu?
4. What is the proportion of households using Insecticide Treated Nets in Katanga and Kivulu?
5. How do slum dwellers of Katanga and Kivulu use Insecticide Treated Nets?

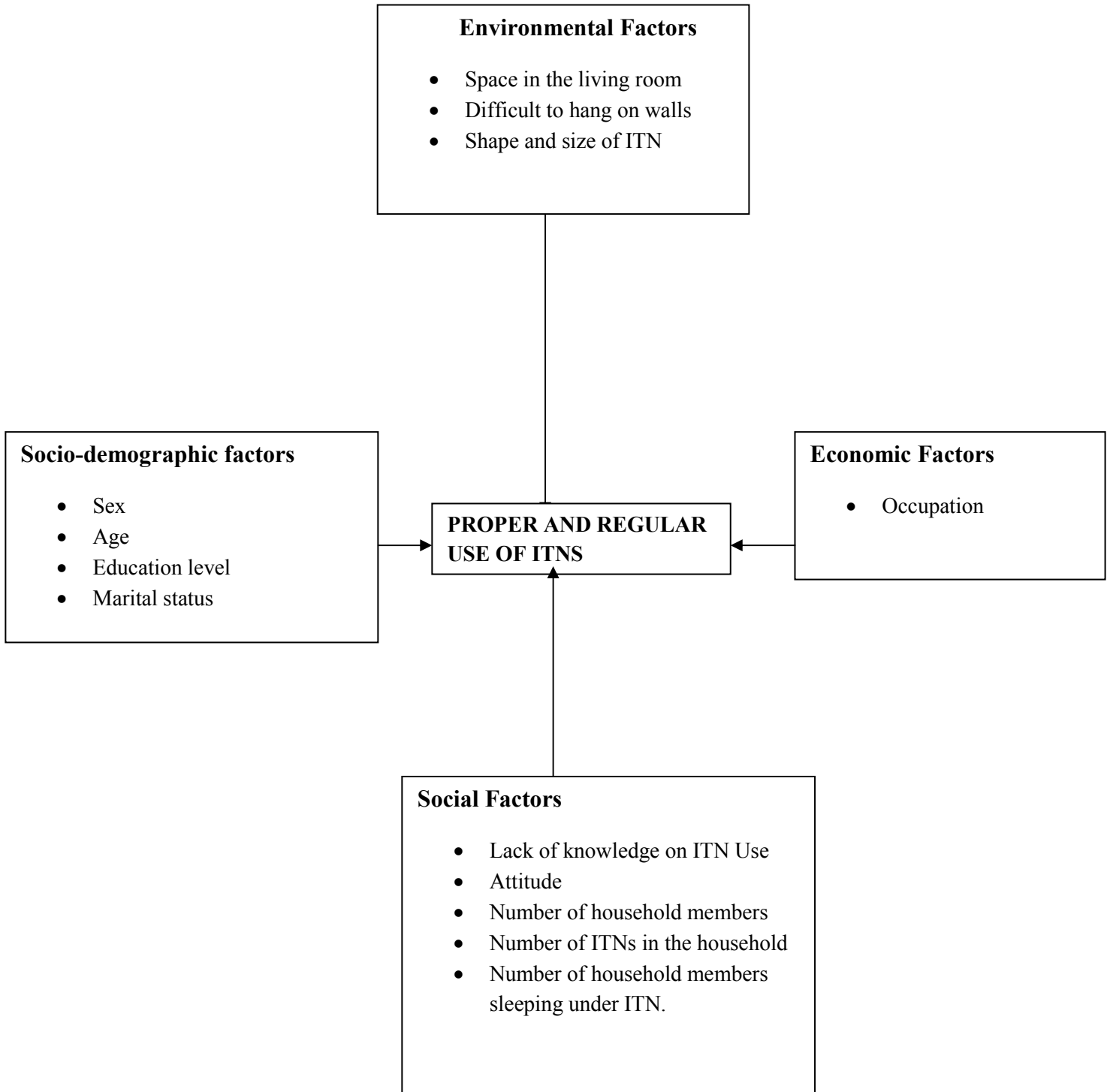
1.7 Significance of the study

The study will bring new insights in the field of public health as far as malaria control among the slum dwellers in Kampala is concerned.

The findings of this study will be beneficial to health workers, stake holders of Health promotion as well as the Ministry of Health as it will identify those factors that affect the proper and regular use of Insecticide Treated Nets among slum dwellers.

Furthermore, the findings will enable Kampala City Council health workers and the Ministry of Health devise means of tackling the factors that compromise the success of Insecticide Treated Nets in controlling malaria which will reduce malaria incidences among slum dwellers

1.8 CONCEPTUAL FRAME WORK



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The use of ITNs to provide personal protection by killing or repelling mosquitoes is one of the major strategies of malaria control (RBM 2002). The effectiveness of ITNs depends on the acceptability by the population at risk and their affordability.

Over 20 studies in Africa and Asia have demonstrated more than 50 percent protective efficacy for individual users of ITNs in reducing malaria episodes, 29 percent protection against severe malarial disease, and substantial protection against anemia (Lengeler 2004).

ITNs have a mean protective efficacy against malaria episodes of approximately 50% in highly endemic areas of Africa (Lengeler and Snow 1996). Bed nets given to pregnant women have been found to be protective to women and their children against malaria in both high and low malaria transmission areas of Kenya (Guyatt and Ochola 2003).

2.2 Knowledge on malaria transmission and prevention.

General awareness of malaria is high in most parts of Uganda. According to the study by Kilian (2002) on malaria related knowledge and behaviors in the three districts in western Uganda indicate a significant improvement in general knowledge about malaria. The HBM follow up survey by MoH/WHO/BASICS II in nine districts of Uganda indicates that most people knew how malaria is transmitted (Fapohunda, B.M, *et al* 2004) however some people have misconceptions about the causes of malaria for example drinking dirty water, raw fruits, poor

sanitation, cold environment (Namusoby *et al*, 1998). These misconceptions certainly have implications for community's malaria preventive behaviors and practices.

An individual's attitude towards malaria as a disease is important in understanding their health seeking behavior and use of preventive measures. Some people believe that malaria is dangerous and can cause death. Others believe that malaria in pregnancy is a normal thing (Mangeni, 2003, Mufubenga, 2004).

2.3 Effectiveness of ITNs in malaria prevention

The Insecticide treated nets have been clearly proven to reduce the malaria transmission by 90%, the morbidity by 60% and mortality by 90% in many high malaria-endemic countries mainly of sub-saharan Africa, China, India and Papua New Guinea (WHO, 2000).

Furthermore, ITNs are useful against many other night biting insects and animals; flies, cockroaches, lice, fleas, scorpions, snakes, bats, rats (WHO, 2002). The insecticide is essential for protection from malaria. People sleeping under nets treated with insecticide do not receive significantly fewer infective bites than those without nets (Lindsay *et al*, 1989).

The results from the first mortality study of Insecticide Treated Nets in Gambia (Alonso *et al* 1991) showed a reduction in deaths from all causes in children under the age of five by 63%. The results of the second study in Gambia confirmed the earlier study results by showing a reduction in mortality of 25% to 38% in children under 9 years of age (D'Alessandro *et al*, 1995).

More than 20 studies of ITNs have been conducted in different areas of the world where malaria is endemic. Most studies have documented a reduction in malaria disease rates between 20% and 63% following the introduction of ITNs (WHO, 2001).

The results from two large-scale trials in Kenya (Nevill et al, 1996) and Ghana (Bink *et al*, 1996) funded primarily by WHO and IDRC/CIDA, are now available and demonstrate a substantial impact on child survival. These studies also supported by a number of other international development organizations are helping to define new research priorities and strategies for the effective implementation of ITN programs (WHO, 2002).

2.4 Attitudes about ITN use

In the study conducted by (Rissa 2000), the community knows that malaria can be prevented while others think otherwise. Some people believe in the traditional methods like bush clearance and drainage as main vector methods. The use of ITNs, Insecticide sprays, mosquito coils, and IPT as vector control methods is less known. Though communities consider nets useful, their acquisition and use is not often a priority. Insecticide Treated Nets (ITNs) are not well known. Among those who know about ITNs, prolonged use is considered unsafe (DISH II, 2002).

A review on community acceptance of mosquito bed nets revealed that various factors such as, cultural, behavioral, demographic, ethnicity, accessibility, gender relations and seasonality of malaria influence the use of mosquito bed nets. Many authors have concluded that although ITNs are effective in malaria prevention, local perceptions, acceptance and use of ITNs as well as use of other preventive methods, are invaluable in malaria control programs (Winch *et al*, 1997).

In a study carried out in western Kenya, on assessment of community's reaction about permethrin-treated bed nets. Although malaria was found to be an important disease, ITNs were believed to be partially beneficial due to people's perceptions that malaria had multiple causes, and further to this, fear was also expressed that chemicals used to treat ITNs were associated with the use of family planning (Alaii et al 2003)

Perceptions on the use of ITNs and other malaria preventive interventions have been conceptualized based on the Health Belief Model developed by Becker (1974). In this model, two main factors influence the likelihood that a person will adopt a recommended preventive action. First, a person must feel susceptible and threatened by the disease, with perceived serious consequences. Secondly, the person must believe that the benefits of practicing prevention outweigh the perceived barriers to the preventive action. Therefore, four constructs can be derived from this model: perceived susceptibility, perceived severity, perceived benefits and perceived barriers.

2.5 Factors influencing use of ITNs

In some studies of bed net use conducted by Njema et al 2003, Okello, 2000; Net Mark 2001A, Collins, 2002, Rissa 2000, DISH 11, 2002 and Kaliisa, 1997), the major reasons for not using nets include; difficulty in hanging the net, little space in the house and poor sleeping conditions and positions, negative perceptions about nets such as: that mosquitoes still can bite through the net, dislike for the net among some household members, some households are resistant to malaria or not bothered by mosquitoes. Sleeping under net is uncomfortable and causes heat while sleeping. Sleeping under net can cause suffocation to children.

Mangeni (2003) in a qualitative study conducted in Busia district reported that non use of ITNs was basically due to; poor sleeping habits for example ‘children slept anyhow throwing hands and feet left and right’ , hindrance to sexual relations and alcoholism. Offensive habits of men like alcoholism affect proper and consistent use.

In a study conducted by Alaii et al (2003) in western Kenya found out that, number of mosquito nets, relative wealth, number of household occupants and the education level of the household

head had no effect on regular use of ITNs however, excessive heat was often cited as the reason for irregular use of ITNs. In the same study, other important reasons for non adherence were disruption of sleeping arrangements, lack of motivation and technical problems like room to hang the net also affects consistency in utilization of an Insecticide Treated Net.

Another study conducted by Mbonye et al, (2005) in Mukono district reported that over half of the 10 Focus Group Discussions (FGDs) thought that chemicals used to treat the nets were very harmful to adults, children and pregnant women. The study found out that over half of the respondents in all FGDs seemed to believe that treated ITNs can affect pregnant women especially in breathing, causes feeling of excessive heat and suffocation at night.

A recent review on community acceptance of bed nets has shown that various factors influence the use of bed nets, including cultural, behavioral and demographic factors, ethnicity, accessibility, gender relations and seasonality of malaria (Heggenhougen et al. 2003 and Binka et al 1997).

2.6 Use of vector control measures

Despite the high levels of knowledge and the positive attitudes of the population towards prevention of malaria, the use of prevention methods is generally low (Mangeni, 2003; Riisa, 2000; Ario, 1997; and Leeku, 2001).

Another study conducted by Riisa (2000) in Mpigi district observed that the most common practices of malaria prevention were bush clearance, clearing empty tins and Chloroquine prophylactic treatment. Other prevention methods such as mosquito nets, insecticide spray, window screening and mosquito coils were not commonly used. Makanga (1997), in his study conducted in the in peri-urban Kampala, the most commonly used control measure was the

mosquito coil, mosquito sprays were the second method of prevention while the use of bed nets ranked third. According to Makanga (1997)'s conclusion, those with high levels of education and stable incomes mostly used the mosquito control methods.

2.7 Mosquito net ownership and use

According to UNICEF (2005) net ownership and use was found to be lowest among the poorest households. Net ownership in central Uganda was 15.3%, eastern Uganda 15.4%, Northern Uganda 14.6% and in the western Uganda 5.5%. Uganda Demographic and Health Survey (2000-2001) put the ownership in urban areas at 32.9% while the rural areas constitute 9.2% (UDHS, 2000-2001).

A study conducted by Net Mark (2001) reported that ITN use is not consistent throughout the year where less than half of the survey respondents with nets used them year around and others using the nets seasonally. According to Net Mark (2001), nets were mainly used during and after the rains when mosquitoes were numerous and when the risk of malaria infection was high.

2.8 Preferences for net shapes and colour

Okello (2001) in his study reported that a rectangular shaped net was preferred by most respondents as compared to conical and triangular shapes, while the popular colour was white. In a study conducted by AMREF (1996) indicated a slightly higher preference for square nets compared to round nets because square nets were easy to hang and covered the beds better while the round nets were easy to hang. Onwejekwe et al (2003) and Binka et al 1997) noted that utilization of ITNs was found to vary with seasons of the year and acceptability of the nets in terms of size, color and shape.

CHAPTER THREE

METHODOLOGY

3.1 Study design

A descriptive cross-sectional study was conducted using quantitative method of data collection.

3.2 Study population

The study population comprised of all household members in every household that had at least one Insecticide Treated Net (ITN) in Katanga and Kivulu slums. It also covered all available ITNs that were being used.

3.3 Sampling procedures

A census was conducted since the actual number of households that owned at least one ITN in Katanga and Kivulu (289) was less than the required sample size (296). Therefore, only 131 households that owned at least one ITN from Kivulu were studied and 158 households that owned ITNs from Katanga were studied. In each household, a household head or spouse was interviewed and in absence of a household head or spouse, any adult above 18 years in the household was interviewed.

3.4 Sample size determination

The sample size was determined using Kish, Leslie (1965) formula as follows:

$$n = \frac{z^2 \cdot p \cdot q}{d^2}$$

Where:

n = the required sample size

z = value corresponding to the 95% confidence interval for a standard normal distribution curve
= 1.96

p = Prevalence of ITN use in Uganda estimated at 26% = 0.26 (MOH, 2005)

q = 1-p

d = maximum acceptable sampling error = 0.05

$$n = \frac{1.96^2 \times 0.26 \times 0.74}{0.05^2} = 296 \text{ respondents}$$

Therefore, 148 households in each slum area were to be studied

3.5 Study unit

The study unit was a household “muzigo” that had at least one ITN in Katanga and Kivulu slums.

3.6 Study Variables

Independent variables.

Environmental variables; size of the living room, difficult to hang on walls, Type of the Net and the size of the bed.

Socio-demographic variables; sex, age, education level, marital status.

Economic variables; Occupation

Social factors; lack of knowledge on ITN use, attitude, number of household’s members, ownership of ITN, number of ITNs in the household, number of household members who sleep under ITNs, number of household members who don’t sleep under ITNs.

Dependent variable: use of ITNs (regular, irregular, properly hanged, state of ITN with or without holes)

3.7 Data collection techniques and Instruments

The data collection tool was pre-tested on dwellers of Kifumbira before the study begun there after the approval was obtained from International Health Sciences University (IHSU)-Research and Ethics committee.

The researcher obtained permission from the LC1 chairpersons permitting him to carry out the study in Katanga and Kivulu. The Principal Investigator (PI) together with the research assistants were accompanied by LC1 chairpersons of these areas who introduced them to the people. The researchers explained the purpose of the study to the respondents, assured them for confidentiality and asked for their consent.

The PI together with the research assistants, moved through each slum area from one rental to another asking the household head whether the household possessed at least one ITN. Households that lacked any single ITN were not studied.

Household head or spouse in the house which possessed an ITN, was interviewed in the selected households. A pre-tested questionnaire containing closed questions was used to collect quantitative information from the respondents and also collected information on the observed state of ITNs in the household. The questionnaire was administered in Luganda for those who knew the local language and English for those who didn't understand Luganda since these are the commonly used languages in these areas. A qualitative component consisting of observation of the ITN state in the households and several related questions provided further understanding of the reasons for irregular and improper use of ITNs.(see appendix page 67, section C)

3.8 Data management and Analysis

After data collection, the researcher went further to edit, code, tabulate and analyzed the responses into meaningful data and findings.

Data was entered in Microsoft access and then transferred to strata for analysis. Descriptive statistics as well as univariate, bivariate and Multivariate logistic regression statistical models

were used to describe factors associated with improper and irregular use of insecticide treated nets. The results are presented in form of tables, frequencies, graphs and pie charts.

3.9 Quality control

Research assistants were trained on how to collect information from the respondents using the collection tools, this was purposely to enable them consistently ask the same questions and also be able to obtain all the information that was needed from the respondents without compromising the data collection process.

The data collection instruments were pretested on Kifumbira slum dwellers before the commencement of the study in order to determine the validity and the reliability of the instruments. Some changes were made in question phrasing and some questions were added after the pretesting.

3.10 Ethical considerations

Ethical approval was obtained from the University, Research and Ethics Committee, and LC authorities in the study areas. Full informed consent was obtained from all study participants. Participants were informed about the purpose, benefits, risks and their study rights in the local language, for example, they had a right to withdraw from the study at any time. Research codes were used instead of participants' real names to ensure their anonymity and confidentiality. (See Appendix for consent form). Study participants were interviewed in private and in places where they felt free to respond to questions.

3.11 Limitations of the study

Semi-structured questionnaire was used as a data collection tool; there was a risk of introducing bias by the interviewers and influence quality and content of information. However this was handled by maintaining neutrality and objectivity during the interview.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents and interprets study findings of 289 respondents. The study aimed at investigating factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers in Kampala. The findings are presented according to the major behavioral elements discussed in the previous sections such as number of household members, Knowledge and practice of the respondents on ITNs, problems for using ITNs, space in the living room, how ITNs are used among others.

The variables examined in this chapter have been the basis under which data was analyzed. Univariate, bivariate and multivariate logistic regression statistical models were used. Tables, graphs and pie charts have been used in the presentation of the information gathered.

4.2 Socio-Demographic Background.

The background characteristics of the respondents are essential in order for the reader to understand the nature of the respondents that were studied. The characteristics studied were; Gender, Age, Education level, Occupation, Marital status, Total household members and members who sleep under ITNs. Table 1 shows the distribution of the respondents' socio-demographic characteristics.

Table 1: Socio-demographic distribution

Factor	Frequency (n=289)	Percent (100)
Gender		
• Female	237	82.0
• Male	52	18.0
Age group in years		
• 18-25	105	36.3
• 26-35	108	37.4
• 36-45	45	15.6
• 46-55	20	6.9
• 56+	11	3.8
Education level		
• None	27	9.3
• Primary	154	53.3
• Secondary	100	34.6
• College/Tertiary	8	2.8
Marital status		
• Married	164	56.8
• Single	67	23.2
• Widowed	17	5.9
• Divorced	41	14.1
Occupation		
• Farmer	8	2.8
• Public servant	7	2.4
• Self employed	141	48.8
• Casual labor	21	7.3
• Trade	15	5.2
• Student	8	2.8
• Housewife	37	12.8
• Jobless	52	17.9
Surveyed area		
• Katanga	158	54.7
• Kivulu	131	45.3

4.2.1 Sex of the Respondents

Of the 289 respondents studied, 82.0% were female and 18.0% were male.

4.2.2 Age distribution

The biggest percentage of respondents (37.4%) fell in the age group 26-35. This percentage reduces as the age increases.

4.2.3 Level of Education

Among the respondents interviewed, it was realized that high percentages of the respondents were primary and secondary school drop outs. About 53.3% attained primary education, 34.6% attained secondary, 2.8% completed tertiary and 9.3 % never went to school.

4.2.4 Marital status

The respondents interviewed belonged to different marital status, these included; married, single, widowed and divorced.

Clearly, the greatest number of the respondents was married, with 56.8%. About 23.2% were single, 5.9% were widowed and 14.1% were divorced.

4.2.5 Income levels

Among the 289 respondents studied, the greatest percentage (48.8%) were self employed, 12.8% were housewives, 7.3% were casual laborers, 2.4% were public servants, 2.8% were farmers, 5.2% were traders, 2.8% were students and 17.9% were jobless.

4.2.6 Surveyed Area

From the table 1 above, it was evident that Katanga had a 54.7% representation compared to 45.3% of Kivulu of surveyed households.

4.3 Knowledge of malaria transmission and prevention.

Knowledge of malaria transmission among the respondents was assessed and the results are presented in table 2 below.

Table 2: People's knowledge of malaria transmission and prevention in the study area

Factor	Frequency (n=289)	Percent (100)	95%CI
Knew how malaria is acquired			
• Yes	263	91.0	88-94
• No	26	9.0	6-12
Knew how malaria is prevented			
• Yes-ITNs	257	88.9	0.03-2.7
• Yes-Other	28	9.7	6-13
• No	4	1.4	85-93
Knew how ITNs prevent malaria			
• Yes	279	96.5	94-99
• No	10	3.5	1-6
Knew how frequent to use ITNs			
• Yes	274	94.8	92-97
• No	15	5.2	3-8

4.3.1 Malaria transmission

Among the respondents studied, 263 (91.0 %) knew how malaria was acquired and the 95% confidence interval lies between (88-94) whereas those who didn't know how malaria was

acquired, were 26 (9.0%) only. The high percentage of 91.0 could positively influence their regular and proper use of ITNs since they were aware of how malaria is acquired.

4.3.2 Malaria prevention

This section was divided into three categories: those who knew ITNs as malaria control measure, those who knew other methods and those who didn't know any method of malaria prevention. The majority of the respondents (88.9 %) mentioned ITNs as malaria control measure because that is what they were using, this high percentage could be as a result of the information that was passed on to them by the Ministry of Health, Forever Living products Uganda and Cerebral malaria Project when donating free Insecticide Treated Nets. However, this high percentage did not necessarily translate into proper use of ITNs as 62.3% of ITNs had holes.

The percentage of those who mentioned other methods of malaria prevention was 9.7%. Other methods mentioned include; use of mosquito insecticide spray, drugs (prophylaxis) and environmental sanitation. Only 1.4 % didn't know how malaria is prevented.

4.3.3 How ITNs prevent malaria

The greatest number of respondents 279 (96.5 %) reported how properly using ITNs can prevent malaria transmission and this was acting as physical barriers or killing of mosquitoes. The 95% Confidence interval lies between (94-99). Only 10 (3.5 %) didn't know how ITNs prevented malaria and their confidence interval was between 1-6 percent.

4.3.4 How frequently should one use ITNs?

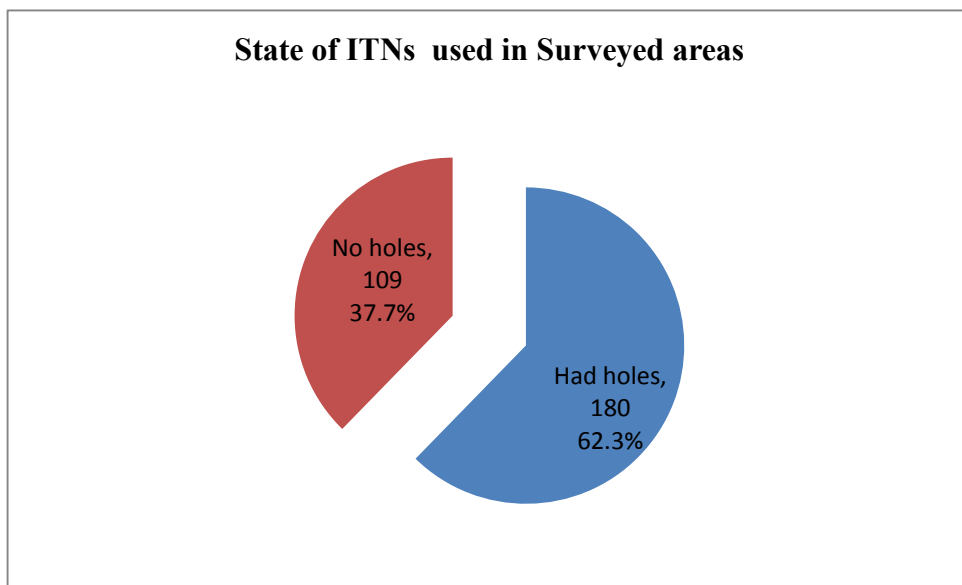
Two hundred seventy four respondents (94.8 %) had knowledge on how frequently one should use Insecticide Treated Nets. The confidence interval was between 92-97, 15 respondents (5.2

%) reported other ways for example ITNs should be used seasonally and only when mosquitoes are seen in the house.

4.4 State of ITNs used by slum dwellers.

The study involved observing all the ITNs that were used in the households. All ITNs that were being used and those that were not being used were observed to see whether there were holes in them. The results are presented by use of a pie chart showing the frequency and percentage of ITNs that were in good state and bad state.

State of ITNs in the surveyed areas

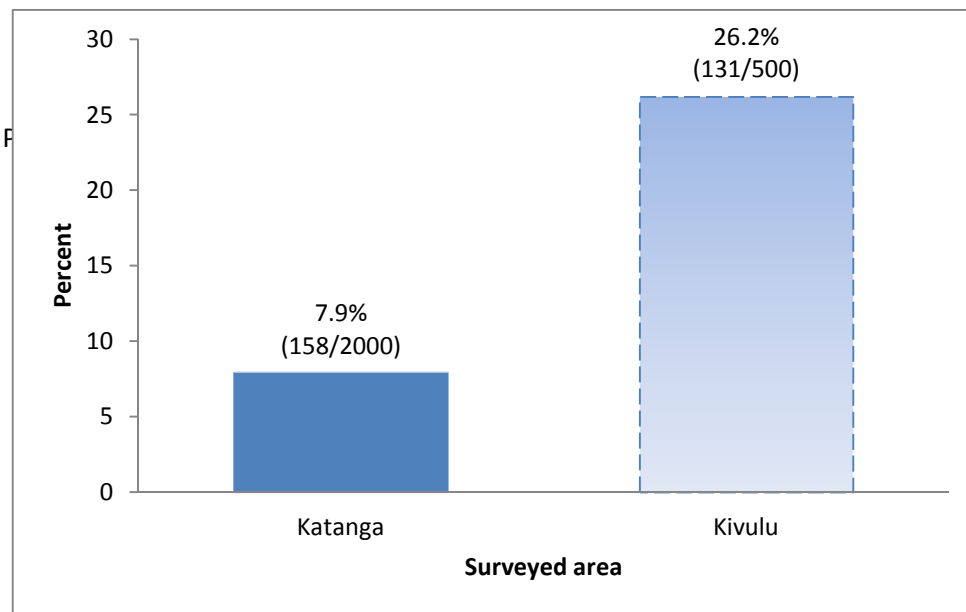


The pie chart above shows that 180 (62.3%) of ITNs had holes while 109 (37.7%) were in good state. This therefore, meant that even though ITNs were used regularly, mosquitoes could still bite people and transmit malaria. This was one of the factors that contributed to increased malaria incidences among dwellers of Katanga and Kivulu.

4.5 Proportion of households using Insecticide Treated Nets in the surveyed areas.

The graph below shows the proportion of households that were using ITNs.

Proportion of households using Insecticide Treated Nets in Katanga and Kivulu



The graph above shows that 158/2000 (7.9%) of the households in Katanga were using ITNs and out of 500 households in Kivulu, only 131/500 (26.2%) were using ITNs. This therefore implies that Kivulu had more households using ITNs compared to Katanga.

4.6 ITN use by category among the respondents

Respondents were categorized into four groups in order to cater for all the different users. These four groups include; Proper-Regular users, Proper-Irregular users, Improper-Regular users as well as the Improper-Irregular users. Their frequencies together with the percentages are presented in table 3 below.

Table 3: Respondents' ITNs use by category

Category	Frequency (n=289)	Percent (100)	95% CI
Proper-Regular	91	31.5	0.26-0.37
Proper-Irregular	18	6.2	0.03-0.09
Improper-Regular	96	33.2	0.28-0.39
Improper-Irregular	84	29.1	0.24-0.34
Total	289	100	

According to table 3 above, of 289 respondents, 31.5% were proper and regular users of ITNs (95% C.I. 0.26-0.37), 6.2% were using ITNs properly but irregularly (95% C.I. 0.03-0.09). The highest percentage of 33.2% represents respondents who were regular users of ITNs but the way ITNs were used was improper (95% C.I. 0.28-0.39) and those who were both improper and irregular users were 29.1% (95% C.I. 0.24-0.34).

4.7 Proper versus Improper use of ITNs by demographic characteristics

The study investigated for proper versus improper use of ITNs by demographic characteristics of the respondents which include; Gender, Age, Education level, Occupation, Marital status and the household size. The frequencies and percentages of proper users are presented against those of

improper users by the demographic characteristics in table 4 below. Proper users together with the improper users add up to 289 overall sample size.

Table 4: Showing Proper versus Improper use of ITNs by demographic characteristics

ITN use							
Variable	Proper		Improper		P-value	OR	95% CI
Gender	Freq	%	Freq	%			
Male	15	13.8	37	20.6	0.158	1.0	NA
Female	94	86.2	143	79.4		0.62	0.32-1.19
Age							
18-25	35	32.1	70	39	0.319	1.0	NA
26-35	41	37.6	67	37.2		1.2	0.69-2.15
36-45	23	21.1	22	12.2		2.1	1.03-4.26
46-55	7	6.4	13	7.2		1.1	0.39-2.94
56+	3	2.8	8	4.4		0.8	0.19-3.00
Education level							
None	15	13.8	12	6.7	0.203	1.0	NA
Primary	58	53.2	96	53.3		0.5	0.21-1.10
Secondary	34	31.2	66	36.7		0.4	0.17-0.98
Tertiary	2	1.8	6	3.3		0.3	0.05-1.57
Occupation							
Farmer	3	2.8	5	2.8	0.150	1.0	NA
Public servant	6	5.5	1	0.6		10	0.78-128.76
Self employed	56	51.4	85	47.2		1.1	0.25-4.78
Casual labor	5	4.5	16	8.9		0.5	0.09-2.99
Trade	4	3.7	11	6.1		0.6	0.09-3.79
Student	2	1.8	6	3.3		0.6	0.06-4.76
Housewife	16	14.7	21	11.7		1.3	0.26-6.12
Jobless	17	15.6	35	19.4		0.8	0.17-3.79
Marital status							
Married	67	61.4	97	53.9	0.303	1.0	NA
Single	24	22	43	23.9		0.8	0.44-1.46
Widowed	3	2.8	14	7.8		0.3	0.09-1.12
Divorced	15	13.8	26	14.4		0.8	0.41-1.69
Household size							
1	5	4.6	8	4.4	0.661	1.0	NA
2-5	88	80.7	138	76.7		1.0	0.32-3.21
6+	16	14.7	34	18.9		0.8	0.21-2.67

Of 289 respondents, 109 were proper users of ITNs and 180 were improper users. Among the proper users, 15 (13.8%) were male while 94 (86.2%) were female. Among the improper users,

37 (20.6%) were male while 143 (79.4%) were female. Gender was found to have no significant association with improper ITN use (OR=0.62; 95% C.I. 0.32-1.19; p=0.158).

Age brackets 18-25 had 35 (32.1%) representation of proper users, 26-35 had 41 (37.6%) proper users, 36-45 with 23 (21.1%) proper users, 46-55 had 7 (6.4%) proper users and 56 and above had a representation of 3 (2.8%) proper users. Among the improper users, 18-25 was represented with 70 (39%), 26-35 had 67 (37.2%), 36-45 with 22 (12.2%), 46-55 had 13 (7.2%) and 56+ had a representation of 8 (4.4%) improper users. Age was not significantly associated with improper use of ITNs (P value=0.319).

According to table 4 above, among the proper users, 15 (13.8%) didn't attain any education level, 58 (53.2%) were primary level holders, 34 (31.2%) had attained secondary level and 2 (1.8%) had attained tertiary level of education. Among the improper users, 12 (6.7%) had never gone school, 96 (53.3%) attained primary level, 66 (36.7%) had attained secondary level and 6 (3.3%) were tertiary education level holders. The results show that there was no significant relationship between education level and improper ITN use (P value=0.203).

By occupation, the above table shows that among the proper users; 3 (2.8%) were farmers, 6 (5.5%) were public servants, 56 (51.4%) were self employed, 5 (4.5%) were casual laborers, 4 (3.7%) were traders, 2 (1.8%) students, 16 (14.7%) housewives and 17 (15.6%) were jobless. Among the improper users, 5 (2.8%) were farmers, 1 (0.6%) public servant, 85 (47.2%) self employed, 16 (8.9%) casual laborers, 11 (6.1%) traders, 6 (3.3%) students, 21 (11.7%) housewives and 35 (19.4%) were jobless. Age didn't show any statistical significance (P value=0.150).

According to marital category, among the proper users; 67 (61.4%) were married people, 24 (22%) were single, 3 (2.8%) were widowed and 15 (13.8%) were divorced. For the improper users; the married were 97 (53.9%), 43 (23.9%) were singles, 14 (7.8%) were widowed and 26 (14.4%) were divorced, Marital status was insignificantly associated with improper ITN use (P value=0.303).

In the category of household size, 5 (4.6%) represents respondents who stayed alone in the house and were proper users, 88 (80.7%) for the proper users who ranged from two to five household members, and 16 (14.7%) for proper users who were six and above. Household members who

ranged from 2-5 reported the highest frequency of 76.7% of improper use, followed by those who were living six and more in the house with a percentage of 18.9% and those who stayed alone in the house and were improper users were 4.4%. The results showed no relationship between number of household members and improper ITN use (P value=0.661).

Table 4 above shows females being more of proper users at 86.2% and also scored high as improper users 79.4% compared to males. Age bracket 26-35 had the highest percentage (37.6%) of proper users while 18-25 age group scored the highest percentage (39%) among the improper users. Respondents who had attained primary level of education scored high on both being proper and improper users of ITNs, the same applied to the self employed, the married and households which had members from two to five.

However, at bivariate level of analysis, demographic factors were found to have no significant association with improper use of ITNs ($P>0.05$).

4.8 Regular versus Irregular use of ITNs by demographic characteristics

The study also investigated for regular against irregular use of ITNs by demographic characteristics of the respondents. Just as in table 4, regular users and irregular users total up to 289. The results are presented in table 5 below.

Table 5: Showing Regular versus Irregular use of ITNs by demographic characteristics

ITN use							
Variable	Regular		Irregular		P-value	OR	95% CI
Gender	Freq	%	Freq	%			
Male	26	13.9	26	25.5	0.017*	0.5	0.26-0.87
Female	161	86.1	76	74.5		1.0	NA
Age							
18-25	65	34.8	40	39.2	0.942	1.0	NA
26-35	71	38	37	36.3		1.2	0.67-2.07
36-45	31	16.6	14	13.7		1.4	0.64-2.87
46-55	13	6.9	7	6.9		1.1	0.42-3.11
56+	7	3.7	4	3.9		1.1	0.29-3.91
Education level							
None	19	10.2	8	7.8	0.553	1.0	NA
Primary	98	52.4	56	54.9		0.7	0.30-1.79
Secondary	63	33.7	37	36.3		0.7	0.29-1.79
Tertiary	7	3.7	1	1		2.9	0.31-28.03
Occupation							
Farmer	4	2.1	4	3.9	0.325	1.0	NA
Public servant	6	3.2	1	1		6	0.48-75.33
Self employed	94	50.3	47	46.1		2	0.48-8.35
Casual labor	10	5.4	11	10.8		0.9	0.18-4.64
Trade	7	3.7	8	7.8		0.9	0.16-4.87
Student	5	2.7	3	2.9		1.7	0.23-12.22
Housewife	24	12.8	13	12.8		1.8	0.39-8.62
Jobless	37	19.8	15	14.7		2.5	0.54-11.17
Marital status							
Married	111	59.4	53	51.9	0.290	1.0	NA
Single	38	20.3	29	28.4		0.6	0.35-1.12
Widowed	13	6.9	4	4		1.5	0.48-4.99
Divorced	25	13.4	16	15.7		0.7	0.37-1.51
Household size							
1	7	3.7	6	5.9	0.064	1.0	NA
2-5	154	82.4	72	70.6		1.8	0.59-5.65
6+	26	13.9	24	23.5		0.9	0.27-3.16

Table 5 above presents regular against irregular ITN users by gender, age, education level, occupation, marital status and household size. Among the regular users, women had a higher representation of 161 (86.1%) than men 26 (13.9). In irregular use, women were at 74.5 % compared to their male counterparts (25.5%). At bivariate analysis, unlike with proper ITN use (Table 4), gender was found to have a significant relationship with irregular ITN use. (P value=0.017).

By age category, among the regular users, 65 (34.8%) were between 18 and 25 years, 71 (38%) were between 26 and 35 years, 31 (16.6%) were between 36 and 45 years, 13 (6.9%) were between 46-55 and 7 (3.7%) were 56 and above. Among the irregular users, 40 (39.2%) were in the age group of 18-25, 37 (36.3%) were between 26 and 35 years, 14 (13.7%) were between 36 and 45, 7(6.9%) were in the age group of 46-55 and 4 (3.9%) were 56 and above. Age was found to have no significant association with irregular use of ITNs, (P value=0.942).

Nineteen (10.2%) regular users had never attained any education level, the rest of the regular users with their education level include; 98 (52.4%) primary, 63 (33.7%) secondary and 7 (3.7%) for tertiary. The irregular users according to education level include; 8 (7.8%) for users who never attended school, 56 (54.9%) for primary school, 37 (36.3%) for secondary and 1(1%) for tertiary education level. Education level had no significant relationship with irregular use of ITNs (P value=0.553).

With occupation and regular use according to the table, 4 (21%) were farmers, 6 (3.2%) public servants, 94 (50.3%) self employed, 10 (5.4%) casual laborers, 7 (3.7%) traders, 5 (2.7%) students, 24 (12.8%) housewives and 37 (19.8%) jobless. Among the irregular users, farmers constituted 4 (3.9%), public servants with 1 (1%), self employed 47 (46.1%), casual laborers 11 (10.8%), Traders 8 (7.8%), students 3 (2.9%), Housewives 13 (12.8%) and for the employed is 15 (14.7). Education level didn't show any significant relationship with irregular use of ITNs, (P value=0.325).

According to table 5 above, with the regular users, 111 (59.4%) were married, 38 (20.3%) were single, 13 (6.9%) were widowed and 25 (13.4%) were divorced. Among the irregular users, the married were 53 (51.9%), 29 (28.4%) were single, 4 (4%) were widowed and 16 (15.7%) were

divorced. Marital status was also found to have no significant relationship with irregular use of ITNs.

By household size, 7 (3.7%) regular users were not staying more than one in the house, 154 (82.4%) represents regular users who were between two to five in the house and 26(13.9%) were more than six in the household. And among the irregular users of ITNs, 6 (5.9%) were staying alone, 72 (70.6%) were between two to five household members and 24 (23.5%) were more than six household members. Just as with proper use of ITN, household size did not have a significant association with irregular use, (P value=0.064).

4.9 Knowledge of Malaria transmission and prevention

The table below presents the association of knowledge of malaria transmission and prevention with proper and regular use of ITNs

Table 6: Knowledge of Malaria transmission and prevention

Proper and Regular use of ITNs								
		No		Yes		P-value	OR	95%CI
Variable		Freq	%	Freq	%			
Malaria transmission								
Didn't know	(No)	8	7.8	18	9.7	0.672	1.0	NA
Knew	(Yes)	95	92.2	168	90.3		1.3	0.5-3.0
Malaria prevention								
Didn't know	(No)	9	8.8	23	12.37	0.057	1.0	NA
Knew correct prevention	(Yes)	94	91.2	163	87.63		11	0.9-125
How ITNs prevent malaria								
Didn't know	(No)	6	5.8	4	2.1	0.175	1.0	NA
Knew	(Yes)	97	94.2	182	97.9		2.8	0.7-10.2
How frequent to use ITNs								
Didn't know	(No)	13	12.6	2	1.1	0.000*	1.0	NA
Knew	(Yes)	90	87.4	184	98.9		13.1	2.9-60.1

The respondents were interviewed on how frequent one should use ITNs and the results showed a significant relationship between the respondents' knowledge of how frequent the Insecticide Treated Net should be used and the improper and irregular use (p=0.000). This therefore, meant

that the respondents' lack of knowledge of how frequent ITNs should be used also contributed to the irregular and improper use of ITNs among the people of Katanga and Kivulu.

Despite the fact that the respondents lacked knowledge of how frequent ITNs should be used, they had knowledge on how malaria is transmitted, the correct malaria prevention method and how ITNs prevent malaria transmission. But these factors didn't show any statistical significance ($p > 0.05$).

4.10 Problems of ITNs use.

Table 7: Frequency distribution of respondents who reported problems when sleeping under ITNs

Problem	Frequency (n=289)	Percentage (%)
Causes heat	49	16.9
Suffocation	12	4.2
Other problems	11	3.8
No problems	217	75.1
Total	289	100

According to the table 7 above, 49 (16.9%) respondents reported ITNs causing heat when sleep under them, 12 (4.2%) reported suffocation, 11 (3.8%) reported other problems like discomfort and treated nets cause itching. Whereas 72 (24.9%) respondents reported problems when sleeping under ITNs, the 217 (75.1%) had no problems with sleeping under ITNs.

4.11 Problems of ITNs and Proper use

The study also investigated whether the reported major problems of using ITNs were associated with proper and improper use of ITNs. The results are presented in table 8 below.

Table 8: Reported problems of ITN use and proper use

ITN use							
	Proper users		Improper users				
Factor	Freq	%	Freq	%	P-value	OR	95% CI
Cause heat							
Yes	24	22	25	13.9	0.078	1.75	0.94-3.25
No	85	78	155	86.1		1.0	NA
Suffocation							
Yes	6	5.5	6	3.3	0.378	1.7	0.53-5.36
No	103	94.5	174	96.7		1.0	NA
Other problems							
Yes	8	7.3	3	1.7	0.023*	4.7	1.21-18.01
No	101	92.7	177	98.3		1.0	

Among the proper users in the table 8 above, 24 (22%) reported ITNs to cause them heat while the 85 (78%) didn't experience the problem of ITNs causing heat. Among the improper users on the other hand, 25 (13.9%) reported ITNs to have caused heat when sleeping under them while the 155 (86.1%) didn't experience the problem of heat caused by ITNs. The analysis found no significant association between ITNs causing heat and improper use, (P value=0.078; OR=1.75; 95% C.I. 0.94-3.25).

With ITNs causing suffocation, among proper users, 6 (5.5%) mentioned the presence of the problem while 103 (94.5%) were not experiencing the problem of suffocation. Among the improper users, 6 (3.3%) mentioned the problem of suffocation caused by sleeping under ITNs while 174 (96.7%) didn't experience the problem of suffocation. There was no significant relation between ITNs causing suffocation and improper use, (P value= 0.378; OR=1.7; 95% C.I.0.53-5.36).

Other problems include; discomfort and ITNs cause itching. Among proper users, those who mentioned such problems were 8 (7.3%) while 3 (1.7%) didn't experience discomfort and itching. Three respondents (1.7%) improper users reported discomfort and itching when sleeping under ITNs while 177 (98.3) improper users didn't experience itching and discomfort. ITNs causing itching and discomfort was significantly associated with the improper use, (P value=0.023; OR=4.7; 95% C.I. 1.21-18.01).

4.12 Problems of ITNs and Regular use

The table below presents major reported problems against regular use of ITNs. The study investigated the association between the major reported problems and regular ITN use.

Table 9: Reported problems of ITN use and regular use

ITN use							
	Regular users		Irregular users				
Factor	Freq	%	Freq	%	P-value	OR	95% CI
Cause heat							
Yes	34	18.2	15	14.7	0.514	1.29	0.66-2.49
No	153	81.8	87	85.3		1.0	NA
Suffocation							
Yes	8	4.3	4	3.9	1.00	1.1	0.32-3.73
No	179	95.7	98	96.1		1.0	NA`
Other problems							
Yes	9	4.8	2	2	0.339	2.5	0.54-11.93
No	178	95.2	100	98		1.0	NA

In the category of regular users, 34 (18.2%) reported ITNs to cause heat, while 153 (81.8%) did not experience the problem of ITNs causing heat. 15 (14.7%) among the irregular users reported heat caused by sleeping under ITNs whereas 87 (85.3%) were irregularly using ITNs without experiencing the problem of heat.

Eight respondents (4.3%) among the proper users reported suffocation as a problem while 179 (95.2%) were not having it as a problem. Those who irregularly used ITNs, 4 (3.9%) reported the problem of suffocation when sleeping under a net while 98 (96.1%) did not experience suffocation.

With other mentioned problems, 9 (4.8%) regular users mentioned, discomfort and itching caused by sleeping under treated net. 178 (95.2%) among the regular users didn't experience discomfort and itching as a problem. For irregular users, 2 (2%) reported discomfort and as a problem while 100 (98%) disregarded them as being major problems.

At bivariate analysis, the major reported problems, ie ITNs causing heat, suffocation, discomfort as well as itching, were insignificantly associated with irregular use of ITNs, (P value >0.05).

4.13 Responses for improper and irregular use of ITNs

The study investigated reasons for improper and irregular use of ITNs, the multiple responses from the improper and irregular users, their frequencies and percentages were recorded in table 10 below.

Table 10: Responses for irregular and improper use of ITNs

Variable mentioned	Count of responses	Percent of responses
Family doesn't have enough ITNs	29	40.1
Uncomfortable to sleep under	19	26.4
ITN got torn	11	15.3
Treated nets cause itching	4	5.6
Inadequate space in the living room	4	5.6
No reason	3	4.05
The nets are too large for the beds	1	1.4
Suffocation	1	1.4
Don't want	1	1.4
Difficulty in hanging	1	1.4

Note: Results above are from a multiple response question

More than one response was possible. As presented in table above 29 (40.1%) reported cases of ITNs not being enough for the household members. This therefore led them to use the few nets they had in turns because of the big household number. Nineteen (26.4%) reported feeling uncomfortable when sleeping under ITNs and eleven (15.3%) cases were of torn ITNs. Other cases reported were; inadequate space in the living room where they could properly hang the net, the size of the Nets that were donated were too large compared to the size of beds they had. Some reported that they were not comfortable with the square nets as they were difficult to hang and covered a big area. Other reported cases were; suffocation when they slept under an ITN, others just didn't want to sleep under ITNs.

Table 11: Logistic regression of factors affecting proper use of ITNs among slum dwellers of Katanga and Kivulu.

Factor		ITN Use		Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
		Proper	Improper		
Gender	Male	15 (13.8)	37 (20.6)	1.0	1.0
	Female	94 (86.2)	143 (79.4)	0.62 (0.32-1.19)	0.77 (0.29-2.01)
Age	18-15	35 (32.1)	70 (39)	1.0	1.0
	26-35	41 (37.6)	67 (37.2)	1.2 (0.69-2.15)	0.89 (0.42-1.91)
	36-45	23 (21.1)	22 (12.2)	2.1 (1.03-4.26)*	2.42 (0.82-7.13)
	46-55	7 (6.4)	13 (7.2)	1.1 (0.39-2.94)	0.77 (0.18-3.27)
	56+	3 (2.8)	8 (4.4)	0.8 (0.19-3.00)	0.96 (0.11-8.39)
Education level	None	15 (13.8)	12 (6.7)	1.0	1.0
	Primary	58 (53.2)	96 (53.3)	0.5 (0.21-1.10)	0.31 (0.09-0.97)
	Secondary	34 (31.2)	66 (36.7)	0.4 (0.17-0.98)	0.19 (0.06-0.65)
	Tertiary	2(1.8)	6 (3.3)	0.3 (0.05-1.57)	0.01 (0.00-0.49)
Occupation	Farmer	3 (2.8)	5 (2.8)	1.0	1.0
	Public servant	6 (5.5)	1 (0.6)	10 (0.78-128.76)	1
	Self employed	56 (51.4)	85 (47.2)	1.1 (0.25-4.78)	0.9 (0.17-5.66)
	Casual labor	5 (4.5)	16 (8.9)	0.5 (0.09-2.99)	0.6 (0.07-4.79)
	Trade	4 (3.7)	11 (6.1)	0.6 (0.09-3.79)	1.1 (0.11-10.61)
	Student	2 (1.8)	6 (3.3)	0.6 (0.06-4.76)	2.0 (0.09-45.48)
	Housewife	16 (14.7)	21 (11.7)	1.3 (0.26-6.12)	1.3 (0.21-8.19)
	Jobless	17 (15.6)	35 (19.4)	0.8 (0.17-3.79)	0.6 (0.10-3.73)
Marital status	Married	67 (61.4)	97 (53.9)	1.0	1.0
	Single	24 (22)	43 (23.90)	0.8 (0.44-1.46)	1.4 (0.58-3.21)
	Widowed	3 (2.8)	14 (7.8)	0.3 (0.09-1.12)	0.2 (0.03-0.89)
	Divorced	15 (13.8)	26 (14.4)	0.8 (0.41-1.69)	0.3 (0.11-0.92)
Household Size	1	5 (4.6)	8 (4.4)	1.0	1.0
	2-5	88 (80.7)	138 (76.7)	1.0 (0.32-3.21)	1.2 (0.27-5.68)
	6+	16 (14.7)	34 (18.9)	0.8 (0.21-2.67)	1.4 (0.27-7.63)
Cause heat	Yes	24 (22)	25 (13.9)	1.75 (0.94-3.25)	1.0 (0.49-2.12)
	No	85 (78)	155 (86.1)	1.0	1.0
Suffocation	Yes	6 (5.5)	6 (3.3)	1.7 (0.53-5.36)	0.9 (0.23-3.36)
	No	103 (94.5)	174 (96.7)	1.0	1.0
Other problems	Yes	8 (7.3)	3 (1.7)	4.7 (1.21-18.01)*	2.5 (0.48-13.1)
	No	101 (92.7)	177 (98.3)	1.0	1.0

(Other problems included itching caused by treated nets and suffocation)

Among the potential determinants examined concerning proper utilization of ITNs in Katanga and Kivulu slums, other factors like ITNs causing itching and feeling uncomfortable when sleeping under ITNs were found to have a significant effect on proper use in this study (Table 8).

However, there were no significant association between gender, age, education level, occupation, marital status, household size, ITNs causing heat and suffocation with improper ITN use.

As shown in Table 9, there was a significant association between treated ITNs causing itching and discomfort and improper use, those who were experiencing itching and discomfort when sleeping under ITNs were more likely to improperly use ITNs compared to the rest in the other categories, Crude Odds Ratio (COR) (95% CI), 4.7 (1.21-18.01).

After adjusting for confounding factors as shown in table 11, all variables were found to have no significant association with improper use of ITNs.

Table 12: Logistic regression of factors affecting Regular use of ITNs among slum dwellers of Katanga and Kivulu.

Factor		ITN Use		OR (95% CI)	Adjusted OR
		Regular	Irregular		
Gender	Male	26 (13.9)	26 (25.5)	1.0	1.0
	Female	161 (86.1)	76 (74.5)	0.5 (0.26-0.87)	0.8 (0.23-3.15)
Age	18-15	65 (34.8)	40 (39.2)	1.0	1.0
	26-35	71 (38)	37 (36.3)	1.2 (0.67-2.07)	0.7 (0.23-2.36)
	36-45	31 (16.6)	14 (13.7)	1.4 (0.64-2.87)	0.9 (0.21-4.49)
	46-55	13 (6.9)	7 (6.9)	1.1 (0.42-3.11)	0.4 (0.06-3.00)
	56+	7 (3.7)	4 (3.9)	1.1 (0.29-3.91)	0.7 (0.04-12.33)
Education level	None	19 (10.2)	8 (7.8)	1.0	1.0
	Primary	98 (52.4)	56 (54.9)	0.7 (0.30-1.79)	0.5 (0.82-2.98)
	Secondary	63 (33.7)	37 (36.3)	0.7 (0.29-1.79)	0.5 (0.08-3.48)
	Tertiary	7 (3.7)	1 (1)	2.9 (0.31-28.03)	1
Occupation	Farmer	4 (2.1)	4 (3.9)	1.0	1.0
	Public servant	6 (3.2)	1 (1)	6 (0.48-75.33)	1
	Self employed	94 (50.3)	47 (46.1)	2 (0.48-8.35)	5.2 (0.55-50.03)
	Casual labor	10 (5.4)	11 (10.8)	0.9 (0.18-4.64)	3.8 (0.25-57.61)
	Trade	7 (3.7)	8 (7.8)	0.9 (0.16-4.87)	3.7 (0.21-66.86)
	Student	5 (2.7)	3 (2.9)	1.7 (0.23-12.22)	1
	Housewife	24 (12.8)	13 (12.8)	1.8 (0.39-8.62)	3.9 (0.37-42.98)
	Jobless	37 (19.8)	15 (14.7)	2.5 (0.54-11.17)	6.1 (0.56-66.85)
Marital status	Married	111 (59.4)	53 (51.9)	1.0	1.0
	Single	38 (20.3)	29 (28.4)	0.6 (0.35-1.12)	0.3 (0.79-0.98)
	Widowed	13 (6.9)	4 (4)	1.5 (0.48-4.99)	1.4 (0.12-15.14)
	Divorced	25 (13.4)	16 (15.7)	0.7 (0.37-1.51)	0.2 (0.05-0.91)
Household Size	1	7 (3.7)	6 (5.9)	1.0	1.0
	2-5	154 (82.4)	72 (70.6)	1.8 (0.59-5.65)	1.8 (0.31-10.72)
	6+	26 (13.9)	24 (23.5)	0.9 (0.27-3.16)	1.3 (0.18-9.59)
Cause heat	Yes	34 (18.2)	15 (14.7)	1.29 (0.66-2.49)	0.2 (0.07-0.47)
	No	153 (81.8)	87 (85.3)	1.0	1.0
Suffocation	Yes	8 (4.3)	4 (3.9)	1.1 (0.32-3.73)	0.3 (0.07-1.54)
	No	179 (95.7)	98 (96.1)	1.0	1.0
Other problems	Yes	9 (4.8)	2 (2)	2.5 (0.54-11.93)	0.5 (0.07-3.57)
	No	178 (95.2)	100 (98)	1.0	1.0

(Other problems included itching caused by treated nets and suffocation)

As shown in table 12 above, after adjusting for confounding factors, determinants examined concerning regular use of ITNs for example gender, age, education level, occupation, marital

status, household size, ITNs causing heat, suffocation, itching and discomfort were found to have no significant effect on regular use of ITNs.

4.14 How slum dwellers used ITNs

All respondents knew how to use Insecticide Treated Nets. They reported hanging and drawing the net over the sleeping area. None of the respondents was using the net as a blanket, curtains or in any other way other than hang and draw. In spite of them knowing how ITNs are used, some respondents poorly hanged them.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 DISCUSSION

5.1 Introduction

This study set out to investigate factors affecting proper and regular use of Insecticide Treated Nets among slum dwellers of Katanga and Kivulu in Kampala. It also assessed peoples' knowledge of malaria transmission and prevention in the slum areas, investigated the state of ITNs used by slum dwellers as well as establishing the proportion of households using Insecticide Treated Nets in Katanga and Kivulu. The major outcomes of this study, proper and regular use of ITNs were modeled as functions of various demographic, social, economic and environmental effects.

5.2 Demographic factors and ITN use

5.2.1 Gender and ITN use

Of the 289 respondents studied, 82.0% were female and 18.0% were male. This was because women are the primary care givers who stay home when men go to work, and on top of that there were some women headed households. This could have also been responsible for the increased number of women respondents compared to men. It was noted that very few men were found at home during the time of interview.

In table 4, which presents proper versus improper use of ITNs, it was found out that out of the 289 respondents, 109 were proper users of ITNs compared to 180 respondents who were improper users. Of the proper users, women were highly represented with 86.2% compared to

men (13.8%). This may be due to the fact that most respondents in the survey were women. Among the improper users, again because women were the most interviewed respondents, reported a higher percentage of being improper users at 79.4% compared to men 20.6%.

At a bivariate level of analysis the relationship between gender and proper use of ITNs was found to be insignificant with the (P-value 0.158). The findings are consistent with the findings of (Alaii *et al* 2003) in a study that was carried out in western Kenya on ITN use that showed a no significant effect between demographic factors and the use of ITNs. However, a study conducted by Binka *et al* 1997, reported differing results where demographic characteristics like gender, age, education, marital status, ethnicity and size of household influence the use of Insecticide Treated Nets.

Table 5 presents respondents who were regularly and irregularly using ITNs. Regular users of ITNs had a total number of 187 compared to 103 irregular users. Out of the 187 regular users, women were highly represented with 86.1% while men who were regularly using the nets were 13.9%. Among the irregular users, 74.5% were female and 25.5% were male. As noted earlier, the big number of women respondents explains their higher percentage on regular, irregular as well as proper and improper use of ITNs compared to men. Unlike with proper use of ITNs, gender was found to have a significant effect on regular use of ITNs. The findings of the study are in agreement with those of Binka *et al* 1997 who reported a significant effect of demographic factors on ITN use.

5.2.2 Age and ITN use

The study found out that majority ITN proper users were in the 26-35 age bracket with a few in the 36-45, 46-55 and 56+, whereas age bracket 18-25 was found to have a bigger percentage of improper users compared to the rest of the age brackets. The findings in both groups (proper and improper users) show that ITN proper and improper use tends to reduce with increase in age of the population. Age bracket 18-25 had the highest percentage of improper users, this could be attributed to the young population in this age bracket who were probably using torn ITNs and had a big number of household members with inadequate ITNs. However, age was found to have no significant effect on proper use. While Alaii et al (2003) produced almost similar results in a study carried out in Kenya on ITN where no significant effects were found with age, gender, marital status, household occupants and education level of the household head, Binka et al (1997) had found significant relationship between age and ITN use.

The findings of the study also show that age bracket 26-35 had more regular users of ITNs compared to the rest of the age bracket. The possible reason may be that, most of the respondents studied were from this age bracket. Most of the young respondent age bracket 18-25 years were irregularly using ITNs because of inadequate space, size and shape of the ITN, the negative attitude towards treated ITN use and insufficient nets. The findings of the study are in agreement with a recent review on community acceptance of bed nets by Heggenhougen et al (2003) that revealed that demographic factors influence use of ITNs.

5.2.3 Education level and ITN use

The study found out that those respondents with primary level of education were highly proper users of ITNs and also constituted the highest percentage of improper users compared to the rest of the respondents from other education levels. With regular and irregular use, still the primary level holders were highly represented compared to other education levels. The possible reason for the high representation of primary holders may be that slums are predominantly having people of low education and economic status. However there was no significant effect of education on proper and regular use of ITN. The findings are in agreement with Alaii et al (2003) in a study conducted in western Kenya that reported no significant association between education level and proper ITN use. However, Heggenhougen et al (2003) and Makanga (1997) reported differing results where they found education to have a significant influence on correct and consistent use of ITNs.

5.2.4 Occupation and ITN use

The study found out that the self employed who constituted the highest number 56 (51.4%) were proper users and 94 (50.3%) regular users of ITNs compared to the rest of the occupation category. According to the study, there were also more of improper users of ITNs from the self employed economic group 85 (47.2%) and 47 (46.1%) irregular users than in the rest of the groups. This was probably due to the fact that there were more of interviewed respondents in this economic group. Secondly most of the slum dwellers are people of low education status, therefore this gives them a chance to create their own small jobs and become self employed since the hope for getting professional jobs is limited by their education level. At bivariate level of analysis, occupation was not significantly associated with proper and regular use of ITNs. The

study finding on occupation and proper -regular use of ITNs are inconsistent with the findings of Winch et al (1997) on a review on community acceptance of bed nets that revealed that occupation can significantly influence proper and consistent use of ITN. Heggenhougen et al (2003) also reported a significant association between demographic characteristics and use of ITNs.

5.2.5 Marital status and ITN use

The study findings indicate that most of the respondents 164 (56.8%) were married who even constituted a bigger percentage of 67(61.4%) among the proper users. Most of the married respondents at least had a child in the household and yet nets were given according to the number of household members where children and pregnant mothers were the first priority. This therefore explains the high number of proper users among the married who used the nets following the instructions that were given to them by the donors. Despite the high representation of the married respondents among the proper users, improper users were still highly represented by the married group with 97 (53.9%). This can be attributed to having a large family with few ITNs, inadequate space in the sleeping room and having torn ITNs together with the negative attitude towards using treated nets. These findings concur with those of Heggenhougen et al (2000) and Binka et al (1997) who reported marital status and other demographic characteristics to have influence on the use of Insecticide Treated Nets.

The study also revealed that among the regular users, 111 (59.4%) married respondents, were highly regular users compared to the rest of the marital categories for example, single with 38 (20.3%), widowed 13 (6.9%) and divorced 25 (13.4%). Still the same group of married respondents had scored highly for having irregularly used ITNs among the respondents who

were irregularly using ITNs. Irregular use by this group of respondents could be due to having many household members with inadequate ITNs, negative attitudes such as treated nets cause itching, heat and suffocation. However at a bivariate analysis, marital status was found to have insignificant association with ITN use. Other studies however provided differing results that revealed that demographic characteristics have been found to influence correct and consistent use of ITNs (Makanga, 1997, Heggenhougen et al 2003).

5.2.6 Household size and ITN use

One of the findings that was found have affected proper and ITN use among the respondents was the number of household members that was more than the ITNs owned which lead some of the household members share one net or even using it in turns. This in agreement with the findings of Binka et al (1997) and Heggenhougen et al (2003) who reported in their studies on ITN use that household size is big determinant of correct and consistent use of ITNs.

The study found out that among the proper users of ITNs, households that had members ranging from 2-5 were highly proper users at 88 (80.7%) and among the improper users, those who constituted the biggest number 138 (76.7%) out of 180 total number of improper users were still from households that had members ranging from 2-5. Some of these households were found with less than two ITNs compared to the household size, which could have affected proper use. The reasons for the higher percentages of use from this same category could be that most respondents interviewed were from households that had 2-5 members. Among the regular users households with members 2-5 were more regular users 154 (82.4%) compared to those lived alone and those who had family members from six and above. This can be attributed to the knowledge that respondents had of regularly using ITNs and the presence of mosquitoes in the house. Household

size that ranged from 2-5 still had the biggest number of irregular users 72 (70.6%) out of a total of 102 improper users. This could be attributed to inadequate ITNs compared to the household size. However, the study found no significant association between Household size and proper – regular use of ITNs. This is inconsistent with the findings of Heggenhougen et al (2003) and Binka et al (1997) who revealed differing results that household size influences proper and regular use of ITNs.

5.3 Knowledge of malaria transmission and prevention

The study found out that most of the respondents (91.0%) knew how malaria was transmitted, the study findings are in agreement with findings from the HBM survey by MoH/WHO/BASICS II in the nine districts of Uganda which indicated that most people knew how malaria was transmitted and prevented (Fapohunda, B.M, et al 2004). The study findings are also consistent with the findings of the study that was carried out by Killian (2002) on malaria related knowledge and behaviors in the three districts in western Uganda that indicated a significant improvement in general knowledge about malaria. The high level of awareness of malaria transmission and prevention among slum dwellers could be a result of the sensitization that was carried out by the projects that donated Insecticide Treated Nets in these slum areas.

5.4 Problems of ITN use

Respondents reported different problems experienced when sleeping under ITNs, the major problems include; sleeping under ITNs causes heat, suffocation, discomfort and treated nets cause itching. The study findings concur with those of (Okello, 2000; Rissa 2000 and Njema et al 2003) that reported that sleeping under ITNs caused heat, suffocation and discomfort.

Another study that was carried out in Mukono by Mbonye et al (2005) also had similar findings that treated nets were very harmful to adults, children and pregnant women and that they caused excessive heat and suffocation at night.

Among the proper users of ITNs, only 24 (22%) reported the problem of ITNs to cause heat compared to 85 (78%) proper users who were not experiencing heat. For the proper users who reported heat as a problem, this couldn't stop them from properly using them. Some respondents mentioned that at least they uncover themselves when there is excessive heat at night than not using ITNs properly. Among the improper users 25 (13.9%) reported ITNs causing heat and this could explain one of the reasons for improper use. Only 155 (86.1%) improper users didn't experience the problem of heat.

Six (5.5%) respondents among proper users experienced suffocation than 103 (94.5%) who didn't have it as a problem. Only 6 (3.3%) out of 180 total number of improper users mentioned suffocation as a problem compared to 174 (96.7%) improper users who didn't get suffocated when sleeping under ITNs. With the regular users of ITNs, 8 (4.3%) reported suffocation as a problem while among 179 (95.7%), suffocation was not a problem. Only 4 (3.9%) irregular users complained about suffocation when sleeping under the net while 98 (96.1%) of the improper users, suffocation wasn't the cause for irregular use, they could be other problems such as inadequate space in the living room, insufficient nets, or net causing heat.

The study found out that ITNs causing heat and suffocation had no significant effect on both proper and regular use while other factors such as ITNs causing discomfort and itching was found to have a significant association with proper use. The findings are in agreement with

(Okello, 2000; Rissa 2000; and Njema et al 2003) who found out that sleeping under nets is uncomfortable and cause itching.

The study found out that the houses for most of the respondents were small in size and were one roomed serving as a bed room, Kitchen and at the same time a store, (*see picture 1 below*). The nets were not raised high enough as evidenced in picture 1 below. This could therefore explain why some respondents experiencing excessive heat and suffocation.

5.5 Factors for improper and irregular use of ITNs

The study investigated factors that influenced proper and regular use of Insecticide Treated Nets among the slum dwellers and the findings indicated that people had different reasons for irregular and improper use of ITNs. Such reasons included inadequate ITNs for the household members, nets being uncomfortable to sleep in, lack of enough space in the living room, nets being too large for the beds they owned, difficulty in hanging the net, caused suffocation and itching.

The findings of this study on the factors influencing proper and regular use of ITNs concur with the findings of (Okello, 2000; Rissa 2000; Njema et al 2003) that indicated that sleeping under Insecticide Treated Nets was uncomfortable and caused heat and suffocation while sleeping. The findings were also consistent with the recent review on community acceptance of bed nets that showed that various factors influenced the use of bed nets, and these included cultural, behavioral and demographic factors, gender relations and seasonality of malaria (Heggenhougen et al 2003).



Picture 1: showing one of the small rooms that serve as the bed room, store, sitting room and a kitchen.

5.6 Nets in bad state

A qualitative component that consisted of observations of the ITN state in the households provided further understanding of the reasons for improper and irregular use of ITNs. The findings indicated that out of the 289 surveyed households 180 had ITNs which had holes. This is attributed to reasons that were given by respondents that included; difficulty in hanging, small living rooms where a single room serves as bed room at the same time the kitchen and store

which put the nets at risk of getting burnt and torn. Some respondents reported that they had rats which bit the nets.

5.7 Conclusion

This study shows that people from the two slum areas had almost similar reasons for improper and irregular use of ITNs. Social, environmental and demographic factors played a big role in contributing to improper and irregular use. Specifically the factors that affected proper and regular use of ITNs include;

A significant number of observed ITNs that had holes, explains the high prevalence of malaria in Katanga and Kivulu due to ITN improper use.

Inadequate living space together with rectangular shape and small size of ITNs which made it difficult for the slum residents to properly hang the net and draw it properly around the sleeping area.

Nets causing heat, suffocation, itching and discomfort were reported as problems that resulted into incorrect and inconsistent use ITNs. Because of these reasons therefore, poorly hanged the nets and used them seasonally especially during the rainy season.

Regarding household number, the majority of improper and irregular users, had insufficient ITNs compared to the household members which led the members use ITNs in turns and poorly hanged which explains the high malaria prevalence among the slum dwellers despite having ITNs.

Regarding the knowledge of malaria transmission and prevention, the majority of the respondents were highly knowledgeable about malaria transmission and prevention but some were improper and irregular users and this is attributed to the factors mentioned above.

It is against this background therefore, that I suggest the following interventions; Continuous sensitization of the people on how to properly hang the net high above the sleeping area in order to reduce the excess heat, suffocation and discomfort when sleeping under a net. ITNs donor projects should also educate the people on mending the torn ITNs. Equity in ITN distribution, where the distribution depends on the need, this will therefore enable all members of the households acquire a net. And finally, donors should donate ITNs depending on the people's priority type, size and shape if success in correct and consistent use is to be registered.

5.8 Recommendations

1. Donor Projects, organizations, KCCA together with the Ministry of Health should frequently sensitize the people to regularly and properly use Insecticide Treated Nets. People should know that Nets are hanged properly high and drawn, spread well around the sleeping area in order reduce suffocation, discomfort and heat.

2. Donors should first find out the types of ITNs preferred by the users other than donating any type. For example most respondents preferred round nets to square nets because square nets were too large for their beds and were difficult to hang as they covered a big area and yet their living rooms were small.

3. There is need by the Kampala capital City Authority (KCCA) to review the current health education package to address the practical Knowledge gaps that may be affecting proper and regular utilization of ITNs. Slum dwellers were knowledgeable about malaria transmission and prevention but were practically improperly and irregularly using the ITNs.

4. The donor's criteria of donating ITNs was based on the number of household members. Households that had more than three members were given a maximum of three Insecticide Treated nets. This therefore meant that a household that had a big number of people would get a maximum of three ITNs. This therefore meant that some members from those households which had more than three members did not get ITNs, which means that ITNs were insufficient for the household members which encouraged incorrect and inconsistent use. Therefore, when donating ITNs by donor projects and the government, distribution of ITNs should depend on the number of household members.

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APPENDIX A



Picture 2: Housing structures of Katanga slum

APPENDIX B



Picture 3: Housing structures in Katanga slum built in such way that there is virtually no space between them.

APPENDIX C



Picture 4: Kivulu slum in Kampala

APPENDIX D: INFORMED CONSENT FORM

FACTORS AFFECTING PROPER AND REGULAR USE OF INSECTICIDE TREATED NETS AMONG SLUM DWELLERS IN KATANGA AND KIVULU.

Hello, my name is _____, I am one of the data collectors in this study. The study is intended to investigate factors affecting proper and regular use of insecticide mosquito nets. To achieve this purpose, your honest and genuine participation by responding to the questions prepared is very important and highly appreciated.

CONSENT

We would like you to answer some questions concerning ITN use. Your individual responses will be strictly confidential and will be used only for this research. You don't have to answer any question if you do not want to and you can withdraw at any time. However, your honest answer to these questions will help us to better understand the situation and contribute to the measures taken to control malaria. We would greatly appreciate your help in participating in this study. Would you be willing to participate?

YES

NO

If yes, proceed and sign below. If no, thank and stop here.

Name of the respondent

Signature or Fingerprint of the respondent

Date/Time

Name of the person administering consent form

Signature of the person administering consent form

Date/Time

APPENDIX E: STUDY QUESTIONNAIRE

Factors affecting proper and regular use of Insecticide Treated Nets (ITNs) among slum dwellers in Katanga and Kivulu.

Questionnaire No. _____ Household No. _____

Area _____ Interviewer _____

Place a code e.g. A1.1 in the box alongside each item according to the response given by the respondent.

A. Socio-demographic characteristic

Ser. No.	Questions	Response categories	Code
A1	Sex of the respondent	A1.1 Male A1.2 Female	
A2	Age of the respondent (in years)	A2.1 18-25 A2.2 26-35 A2.3 36-45 A2.4 46-55 A2.5 56 and above	
A3	Education level	A3.1 Never went to school A3.2 Primary A3.3 Secondary A3.4 College/Tertiary	
A4	Occupation	A4.1 Farmer A4.2 Public servant A4.3 Self employed A4.4 Casual labor A4.5 Trade A4.6 Student A4.7 House wife A4.8 Jobless A4.9 If other, (specify) _____ _____	
A5	Marital status	A5.1 Married A5.2 Single A5.3 Widowed A5.4 Divorced	
A6	Total number of Household members	A6.1 1 A6.2 2-5 A6.3 6 and above	
A7	How many of the members sleep under ITNs	A7.1 1 A7.2 2 A7.3 3-5 A7.4 All A7.5 none	

B. Knowledge and practice of the respondent on ITN

No.	Question	Response	Code
B1	How do we acquire Malaria?	B1.1 Mosquito bite B1.2 Bad season B1.3 Drinking un boiled water B1.4 If others, (specify)_____ _____	
B2	How can Malaria be prevented?	B2.1 Household spray B2.2 ITN use B2.3 Drugs (prophylaxis) B2.4 Environmental sanitation B2.5 Others, (specify)_____ _____	
B3	How does ITNs prevent Malaria transmission?	B3.1 Physical barriers B3.2 Kills mosquito B3.3 Irritate mosquito B3.4 Not known B3.5 If other, (specify)_____ _____	
B4	How frequent should one use the Insecticides Treated Nets?	B4.1 Every night B4.2 Seasonally B4.3 When mosquitoes are seen in the house B4.4 If other, (specify)_____ _____	
B5	Do you sleep under the Insecticide Treated Net? <i>(If No, go to B10)</i>	B5.1 Yes B5.2 No	
B6	If YES to B5 above, how frequent do you sleep under the Insecticide Treated Net?	B6.1 Every night B6.2 Seasonally B6.3 When mosquitoes are seen in the house B6.4 If other, (specify)_____ _____	
B7	How do you use the Insecticide Treated Nets?	B7.1 Hang and draw B7.2 Use as blanket B7.3 Use as curtains in doors, windows and ventilators B7.4 If other, (specify)_____ _____	
B8	Does sleeping under an Insecticide Treated Net cause you any problem?	B8.1 Yes B8.2 No	
B9	If YES to B8 above, what is the major problem?	B9.1 No comfort B9.2 Causes heat B9.3 Suffocation B9.4 Nets are treated B9.5 If other, (specify)_____ _____	

B10	If NO to B5 above, why? <i>(more than one response is possible)</i>	B10.1 Lack of enough space to hang the net. B10.2 Uncomfortable to sleep in. B10.3 No mosquitoes in the house B10.4 Difficulty in hanging B10.5 Nets are treated therefore have side effects B10.6 Don't want B10.7 Forget B10.8 No reason B10.9 If other, (specify)____ _____	
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C. OBSERVED STATE OF ITN IN HOUSEHOLD

No.	Points to be observed	Observation	Code
C1	Number of mosquito Nets seen in house	C1.1 One C1.2 Two C1.3 Three and above	
C2	The type of Mosquito net that a household owned	C2.1 Retreatable C2.2 Permanently treated C2.3 Not treated	
C3	Number of beds/Places of sleep observed with mosquito net	C3.1 One C3.2 Two C3.3 Three and above C3.4 None	
C4	Is the bed net hanged (placed) properly over bed or sleeping area?	C4.1 Yes C4.2 No	
C5	Is there any hole (throne) in the mosquito net?	C5.1 Yes C5.2 No	

THANK YOU