ACCESS AND USE OF LONG LASTING INSECTICIDE-TREATED NET AMONG HOUSEHOLDS IN ENUGU EAST LOCAL GOVERNMENT AREA OF ENUGU STATE, NIGERIA

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CERTIFICATION

I, Emeka-Owoh, Ekene A., a postgraduate student of the Institute for Development Studies, with Registration Number, PG/MSc./11/61078, do hereby certify that the work incorporated in this project report is original and has not been submitted in part or in full for Diploma or degree of this or any other University.

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APPROVAL

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DEDICATION

This Project work is dedicated to Almighty God for His mercies and favour upon my life.

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ABSTRACT

Recognising the need for everyone to sleep under a long-lasting insecticide-treated nets (LLINs), th Roll-Back-Malaria (RBM) and African Heads of states, in April 2000, established the "Abuja targets," which includes LLIN use by at least 60% of pregnant women and under-fives in Africa by 2005. These targets and those of the Millennium Development Goals to reduce malaria morbidity and mortality can only be achieved through high access rate of LLINs and insurance that people who receive the nets actually sleep under them on a regular basis. This study aimed to ascertain access and use of LLIN, as well as the effects of behavioural change on the use of LLIN among households in Enugu East Local Government Area (EELGA) of Enugu State, Nigeria. Questionnaire was administered to 17 households selected from each of the 24 communities in EELGA by a combination of purposive and snowball techniques. Results showed that access to LLIN was signficant (76%), but the use of LLIN was not significant (21.1%). About 72.8% of respondents agreed that habit had significant effect on use of LLIN among hoseholds in Enugu East Local Government Area of Enugu State of Nigeria. Apathy to government programmes (77.7%), fear of side-effects (82.1%), distortion of sleeping arrangements inside the home (80.1%), interference of nets with daily activities in non-bed sites (79.1%), apparent absence of mosquitoes (77.7%), and perceived net ineffectiveness (76.7%) were aspects of habit or behavioural change that affected the use of LLIN by households in EELGA of Enugu State, Nigeria. It was recommended that behaviour change should become the next issue to tackle in the efforts to roll malaria back in communities.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Disease control and prevention are an important component of health security. A growing body of evidence shows globally those ambitious health goals such as the health related Millennium Development Goals (MDGs) cannot be achieved without greater attention to and more effective investment in health systems. A handful of disease-specific interventions are being financed through various global health initiatives (GHIs). These unprecedented investments have undoubtedly yielded returns in terms of improved specific health outcomes for AIDS, tuberculosis (TB) and malaria (WHO, 2007).

However, malaria control will not eliminate the mosquito vector, the parasite, or the favorable environmental conditions for transmission in many locations. To keep malaria at bay, countries must maintain high levels of coverage of preventative interventions even in the absence of a large number of cases. Relaxation of control - whether because of the decline in political will, a decrease in funding, or some other reasons - increases the risk of resurgence in transmission and of epidemics. The goal of sustained control is to maintain universal coverage with interventions until countries enter the elimination stage. Sustained control will require strong political commitment at country level and a continued focus on the health systems activities started during scale-up (particularly communication and behaviour change efforts and monitoring and evaluation). In addition, maintaining high coverage levels will require effective

distribution approaches aimed at strengthening all routine delivery mechanisms and improving integration with other disease programmes where appropriate. Strong inter-programme collaboration, robust procurement and supply chain management systems and accurate forecasting capabilities are pre-requisites. Increased decentralization of decision-making and budgeting will facilitate strengthened community participation in the delivery of interventions (Oyeyemi, Alawode and Sogunro, 2010).

Malaria is an infectious disease caused by *Plasmodium* parasite. The four identified species of this parasite causing human malaria are *Plasmodium falciparum*, *P. vivax*, *P. ovale* and *P. malariae*. In Nigeria, 98% of all cases of malaria are due to *P. falciparum*. This is the species that is responsible for the severe form of the disease that leads to death. It is transmitted from bites of an infected female anopheles mosquitoes to man (Oyeyemi, Alawode and Sogunro, 2010).

Malaria is a disease that is preventable and curable, yet it continues to be responsible for over 60% of outpatient visits and 30% hospital admissions in Nigeria (WHO, 2011). The magnitude of malaria problem is such that it is one of the leading causes of infant mortality and maternal morbidity in African. The morbidity of malaria is such that it affects the productive capacity of adults, and children affected will either not be able to participate actively in class or will not attend school at all. The disease has impacted negatively on the economy with about 132 billion Naira lost to the disease as cost of treatment and loss in man-hours (RBM/WHO, 2000).

Although immunity is developed by individuals over time, an average child or adult still has 2-3 bouts of malaria in one year. This translates to significant loss of household income and productivity man hours and economic loss for any state, region or country. The implication is that malaria is not just a health problem but also a socio-economic and development problem.

This explains why it has continued to engage the attention of development partners all over the world, as one of the diseases of interest, in the concerted efforts towards the achievements of several Millennium Development Goals (MDGs), especially MDGs 1, 3, 4 5 - which focus on poverty, universal education, infant and maternal morbidity and mortality (MDG, 2008).

After years of unco-ordinated and insufficient responses to this global health threat, the Roll Back Malaria Partnership (RBM) was formed in 1998 to align global health and development advocates, raise malaria on political and development agendas and unite key stakeholders behind an ambitious but achievable strategy to end malaria worldwide. RBM is a global partnership founded by the World Health Organization (WHO), the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF) and the World Bank with the goal of halving the world's malaria burden by 2010 - estimated to be greater than 300 million acute illnesses and 1 million deaths per year (WHO, 2008).

The RBM partnership includes national governments, civil society and non-governmental organizations, research institutions, professional associations, UN and development agencies, development banks, the private sector and the media. The strength of RBM is the diverse strengths and expertise of its many partners. RBM was founded in response to a growing concern by governments, particularly in Africa, about the continuing and increasing burden of disease and death due to malaria. RBM is being built on the shoulders of recent successful efforts in malaria-affected countries and regions to improve and support capacity to scale up action against malaria. The RBM partnership supports efforts to tackle malaria wherever it occurs. However 90% of the malaria burden is in Africa, south of the Sahara (RBM/WHO 2002). In addition, almost everywhere that malaria occurs, but particularly in Africa, the burden of disease and death falls mainly on two vulnerable groups: young children and pregnant women. As a result, the

focus of RBM and its greatest challenges are in reducing the burden of malaria in these two vulnerable groups in the African region.

Sustained country leadership and commitment are essential in overcoming malaria. The Roll Back Malaria (RBM) partnership has developed the Global Malaria Action Plan (GMAP), first and foremost to support countries. The GMAP provides a global framework for action around which partners can co-ordinate their efforts. Developed through an intensive consultative process, it consolidates the collective input of 30 endemic countries and regions, 65 international institutions and 250 experts from a wide range of fields. The GMAP presents:

(i) a comprehensive overview of the global malaria landscape,

(ii) an evidence-based approach to deliver effective prevention and treatment to all people at risk, and

(iii) an estimate of the annual funding needs to achieve the goals of the RBM Partnership for 2010, 2015 and beyond. The GMAP is a living document: as approaches and tools evolve to fight malaria, so will the plan.

The GMAP outlines the RBM partnershipôs vision for a substantial and sustained reduction in the burden of malaria in the near and mid-term, and the eventual global eradication of malaria in the long term, when new tools make eradication possible. To reach this vision, the targets of the GMAP are to:

1. Achieve universal coverage, as recently called for by the UN Secretary-General, for all populations at risk with locally appropriate interventions for prevention and case management by 2010 and sustain universal coverage until local field research suggests that coverage can gradually be targeted to high risk areas and seasons only, without risk of a generalized resurgence;

2. Reduce global malaria cases from 2000 levels by 50% in 2010 and by 75% in 2015;
3. Reduce global malaria deaths from 2000 levels by 50% in 2010 and to near zero preventable deaths in 2015;
4. Eliminate malaria in 8-10 countries by 2015 and afterwards in all countries in the pre-elimination phasetoday; and
5. In the long term, eradicate malaria world-wide by reducing the global incidence to zero through progressive elimination in countries (GMAP, 2008).

The RBM partnershipôs control strategy aims to reduce malaria morbidity and mortality by reaching universal coverage and strengthening health systems. The GMAP defines two stages of malaria control:

1) s*caling-up for impact (SUFI*) of preventive and therapeutic interventions, and
2) *sustaining control* over time.

In scaling-up for impact, the goal is to rapidly reach universal coverage for all populations at risk with locally appropriate malaria control interventions (i.e. LLINs, IRS, IPTp, drugs and diagnostics), supported by strengthened health systems. Delivery strategies may involve mass campaigns, distribution of interventions through existing public- and private-sector outlets, and by community health workers, for example. Strengthening health systems, including capacity building, for malaria control must begin during scale-up and continue beyond this.

To achieve universal coverage by 2010, core malaria control interventions needed are:

a. 730 million LLINs globally (about 350 million for Africa). In Africa, approximately 50 - 100 million nets needed will be distributed in 2008, leaving 250-300 million new LLINs that need to be distributed in 2009 and 2010,
b. 172 million households sprayed annually with insecticides,

c. 25 million treatment courses of IPTp for pregnant women in Africa,

d. 1.5 billion diagnostic tests (microscopy or RDTs), and

e. 228 million treatments of ACTs (*P. falciparum)*; 19 million doses of CQ and PQ (*P. vivax).*

Sustaining control is important to prevent the resurgence of malaria. After core interventions are scaled up, the malaria burden will drop and the need for case management is expected to fall dramatically (GMAP, 2008). RBM in Nigeria builds on the global strategies for malaria control. Multi-pronged and proven to work, these strategies include prompt and effective case management, intermittent preventive treatment (IPT) of malaria in pregnancy and integrated vector management which includes the use of insecticide-treated nets (ITNs), indoor residual spraying and environmental management. Other cross-cutting interventions include advocacy, communications and social mobilization, effective programme management, monitoring and evaluation, and partnerships and collaboration.

In order to minimize socio-economic impact of malaria in the country, the Federal Ministry of Health (FMOH) and Roll Back Malaria (RBM) partners have adopted Scale Up for Impact (SUFI) approach in the revised National Malaria Strategic Plan (NMSP). As part of effort to scale up Long Lasting Insecticidal Net (LLIN) ownership and utilization in the country, the target was to increase LLIN access and utilization in Nigeria. The NMCP and the State Malaria Control Programme at state level, with the support of partners, recently committed to a strategy of universal access for all malaria interventions as the optimal approach to malaria control. This new strategy expands the programmatic focus from children under five and pregnant women to the entire population at risk. This includes ensuring universal coverage with Long Lasting Insecticide Treated Bed-nets (LLINs) across the entire country by the end of 2010 which

amounts to the distribution of over sixty million nets within a two year period, a scale-up of a magnitude not witnessed anywhere else in the world (RBM/WHO, 2002).

Over the past two decades, the use of ITNs has been established through multiple randomized trials as an effective and cost-effective malaria control strategy for sub-Saharan Africa (Lengeler, 2004). But access rates with ITNs remain low. Until recently, one of the key challenges to widespread coverage with ITN was the need for regular re-treatment with insecticide every 6 months, a requirement a few households complied with (Alessandro, 2001). This problem was solved recently through a scientific breakthrough: LLINs, whose insecticidal properties last at least as long as the average life of a net (4-5 years), even when the net is used and washed regularly. The prototype LLIN, the Olyset Net, was approved by WHO in 2001, but did not get mass-produced until 2006.

ITNs are a low-cost and highly effective way of reducing the incidence of malaria in people who sleep under them, and they have been conclusively shown in a series of trials to substantially reduce child mortality in malaria-endemic areas. By preventing malaria, ITNs reduce the need for treatment and the pressure on health services, which is particularly important in view of the increase in drug resistant *falciparum* malaria parasites. It is often considered that one of the main drawbacks of ITNs is the low re-treatment rate, however, with the LLINs, the issue of net re-treatment may be resolved as long as the price is not prohibitively increased by the specific treatment (Kolaczinski, 2010).

1.2 STATEMENT OF THE PROBLEM

Ultimately it has been recognised that in order to reduce the burden of malaria disease, everyone should sleep under a LLIN. In April 2000, RBM and African Heads of states established the ñAbuja targets,ò which includes LLIN use by at least 60% and above of pregnant women and under-fives in Africa by 2005. However, a few countries have met this target, and ownership of LLINs among pregnant women in Africa is currently only 3 percent, with rates in Nigeria reflecting this regional figure.

Achieving the Abuja targets has not been easy, and the logistical challenges have received most attention to date. What has now become apparent is that universal access effort today will not lead to achievement of the Millennium Development Goals of reduced malaria morbidity and mortality unless there are:

a) provision of nets through routine services to ôkeep-upô coverage into the future and, more importantly, and

b) insurance that people who receive the nets actually sleep under them on a regular basis.

The determination of distribution mechanisms that will assure high coverage with the LLINs remains a topical issue in Nigeria and in many sub-Saharan African countries. The public health care system was initially used to distribute LLINs in Nigeria, but the coverage was quite low. Currently, commercial sector distribution and social marketing of LLINs is being promoted in some states in Nigeria, but the coverage remains low.

It should be said that the first priority of a LLIN programme is to get adequate numbers of nets out to households. Analysis of data from 15 country Demographic and Health Surveys showed that among LLIN-owning households, intra-household access to LLINs (the ratio of household members per LLIN) was the strongest and most consistent household factor associated

with LLIN use among children (Elsele et al, 2009). Recent efforts promoting the use of LLIN have shifted their emphasis from a focus on vulnerable populations to a broader objective of universal coverage, defined as the household level of the use of insecticide-treated nets by all household members regardless of age or gender. There is an emerging consensus that a ratio of at least one LLIN for every two household members is typically sufficient to achieve universal coverage in a population (WHO, 2007). Simply put, if there are not enough nets in a household, use by vulnerable populations will be jeopardized.

Besides access, use of LLIN is another factor. The use of LLIN may not be significant in households because of habit. In order words, behavioural change becomes the issue. This may be dependent on lack of belief of the messages being spread in favour of use of LLIN. Apathy to government programmes may be a hinderance to use of LLIN. Fear of side-effects might also limit use of LLIN by households, just like sleeping arrangements inside the home. Other factors that can possibly limit the use of LLIN are nets in non-bed sites interfering with daily activities, perceived absence of mosquitoes limits use of LLIN among households, and lack of perceived net effectiveness. The extent of use and factors militating against the use of LLIN need, therefore, to be investigated.

1.3 OBJECTIVES OF THE STUDY

The purpose of the study is to ascertain access and use of LLIN among households in Enugu East Local Government Area (EELGA) of Enugu State, Nigeria. The specific objectives of the study are to:

1. Ascertain the access to LLIN among households in EELGA.
2. Ascertain the use of LLIN among households in EELGA.

3. Ascertain the effects of behavioural change on the use of LLIN among households in EELGA.

1.4 RESEARCH QUESTIONS

1. How significant is the access to LLIN among households in EELGA?
2. How significant is the use of LLIN among households in EELGA?
3. How does behavioural change affect the use of LLIN among households in EELGA?

1.5 RESEARCH HYPOTHESIS

H_{01}: There is no significant access to LLIN among households in EELGA.

H_{02}: The use of LLIN is not significant among households in EELGA.

H_{03}: Behavioural change has no significant effect on the use of LLIN among households in EELGA.

1.6 SIGNIFICANCE OF THE STUDY

The study will primarily be of immense benefit to households, as it will sensitize them on the use of LLINs to prevent and control malaria. It will equally benefit the government, NGOs, agencies and all stakeholders involved in disease control and prevention to know the level of coverage and use of LLINs among households, especially those in rural communities. As a country, the study will also help appraise efforts made in the fight against malaria, to help in economic development planning.

1.7 SCOPE AND DELIMITATIONS OF THE STUDY

This research work focuses on households in Enugu East Local Government Area (LGA) of Enugu State. Enugu East LGA of Enugu State is one of the seventeen (17) LGAs in Enugu State. The districts that make up the LGA are Mbulujodo, Mbulu Oweghe, Mbulu Iyiukwu, Emene and Trans Ekulu. There are 24 communities in EELGA.

LLINs are said to have been distributed in the LGA by various health programmes. The study covers the access and use of LLINs among households. The limitation of the study is that its findings cannot be generalized for Enugu State, let alone, Nigeria. The study would need to be replicated in other locations to enable generalisation of findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This sections examines related literature under conceptual literature, theoretical literature, empirical studies, summary and gaps in reviewed literature.

2.2 CONCEPTUAL LITERATURE

To understand malaria today, it is important to acknowledge the history of the disease and previous global efforts to control and eradicate it. In the mid-19th century, malaria was endemic in most countries and territories of the world, affecting about 90% of the worldôs population and stretching as far north as the Arctic Circle (Wernsdorfer, 2008). After successful efforts to reduce malaria with DDT beginning in 1945, in 1955 the 8th World Health Assembly launched the Global Malaria Eradication campaign for all malarious countries except Madagascar and those of sub-Saharan Africa, using IRS, primarily with DDT, as a vector control tool together with case management. In all, 37 of the 143 countries that were endemic in 1950 were freed from malaria by 1978, of which 27 are in Europe or the Americas (GMCE/WHO, 2008).The effort had a positive impact on malaria mortality and morbidity in almost all targeted countries. However, some of the countries were unsuccessful in interrupting transmission. By 1973 it was concluded that in some countries a ñtime-limited eradication programme was impracticableò, and strategies were shifted into long-term integrated control programmes. The Global Malaria Eradication campaign was abandoned. Little attention was paid to malaria over the subsequent years. Despite the end of the official WHO campaign, a number of countries have

successfully eliminated malaria since that period, including Tunisia in 1979, Maldives in 1984, and the United Arab Emirates in 2007.

The RBM Partnership has made great strides in increasing awareness of malaria and global coverage with key malaria-control interventions. However, much remains to be done to achieve the ambitious targets of the RBM Partnership: by 2010, universal coverage with appropriate malaria interventions and 50% reduction in fatalities and cases from 2000 levels; and by 2015, near zero preventable deaths and 75% case reduction from 2000 levels. Today, effective tools exist that make it possible to prevent and treat malaria in most settings, with the potential to substantially reduce the morbidity and mortality from malaria. The primary tools used today for prevention are: long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS) in which insecticides are sprayed on the walls of homes, and intermittent preventive treatment for pregnant women (IPTp) to prevent infection.

The Global Malaria Action Plan (GMAP) has been created by the Roll Back Malaria (RBM) Partnership, the global coordinating body for fighting malaria. The RBM Partnership comprises all malaria-endemic countries, bilateral and multilateral development partners, the private sector, nongovernmental organizations, community-based organizations, foundations, and research and academic institutions involved in malaria control as well as the RBM Secretariat, Working Groups, and Sub-Regional Networks. The RBM Board recommended that a Global Malaria Action Plan be developed through an in-depth consultative process. Accordingly, the RBM Partnership developed the plan with the involvement of over 250 individuals from endemic countries, global partner organizations, and experts from a diverse set of fields ranging from economics to malaria control to epidemiology. The input and advice of these contributors have been invaluable in the creation and revision of the plan. Many areas of ongoing work are

represented in this plan. As they evolve, they will further influence the way that the RBM Partnership addresses malaria. In the long term, malaria will be eradicated worldwide. Today, no timeline has been set for achieving this target. As new tools and approaches are developed, the RBM Partnership will review its targets and determine when it will be possible to specify timelines for worldwide elimination and eradication. The RBM Partnership reaffirms the targets articulated in its Global Strategic Plan 2005-2015. By 2010, through targeting universal coverage, 80% of people at risk from malaria are using locally appropriate1 vector control methods such as long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS) and, in some settings, other environmental and biological measures (GMAP, 2008).

Since 2002, the Alliance for Malaria Prevention (AMP), as part of the Harmonization Working Group (HWG) within the Roll Back Malaria (RBM) partnership, has been supporting countries with the planning and implementation of long-lasting insecticide treated net (LLIN) mass distribution campaigns. Between 2002 and 2007, the majority of the campaigns supported involved distribution of LLINs targeted to children less than five years of age. Since 2007, with the change in policy from targeted to universal coverage, the majority of campaigns supported have been aimed at achieving universal coverage of the total population at risk of malaria with LLINs, stand alone or integrated with other interventions, to rapidly scale up coverage of malaria prevention and sustain it in a bid to reach the Roll Back Malaria (RBM) and Millennium Development Goal (MDG) objectives. The shift in policy to universal coverage led to new challenges in mass LLIN distribution. The main challenges have been quantification, defining strategies for LLIN allocation to households and identification of beneficiaries, timely and detailed micro-planning, logistics planning and implementation (given the volume of commodity that now needs to be managed), communication for ensuring utilization of LLINs once coverage

has been achieved, data management, effective supervision, monitoring and evaluation, and reporting.

Despite these challenges, enormous gains have been achieved in a number of countries in terms of scaling up malaria prevention with LLINs. Between 2008 and the end of 2010, a total of 289 million long-lasting insecticide treated mosquito nets were delivered in sub-Saharan Africa, representing 76% of the total need to reach the RBM universal coverage targets. Despite these impressive numbers, there is still work to be done to complete scale up in countries that have not yet reached their targets. A further challenge for the malaria community is defining strategies for continuous distribution of LLINs that will ensure that the total population at risk of malaria is able to access LLINs when initially distributed nets are worn out, damaged or expired. The most common continuous distribution systems to date are free or subsidized LLINs to targeted groups through antenatal care (ANC) or expanded program for immunization (EPI) routine health visits. However, additional channels will be needed to ensure full population access. As countries move past the scale-up phase, it is important to determine the various channels and strategies for continuous LLIN distribution.

There is still much to do to achieve the RBM targets and bring the benefits of universal coverage to a wider range of countries. Country level capacity building and health systems strengthening will be critical to ensure countries can deliver the needed interventions to populations at risk. Data from the World Health Organization (WHO) World Malaria Report 2008 shows that many countries are far from meeting the universal coverage targets for key interventions. For example, across 18 African countries in 2006-2007, 34% of households owned an insecticide-treated net (ITN) and 23% of children under five slept under an ITN. In addition, UNICEF data on the number of ITNs produced shows an increase from 30 million ITNs in 2004

to 95 million ITNs in 2007, with further increases expected in 2008. The trend in funding for malaria is positive. Unprecedented amounts of money have gone to malaria control since 2004, reaching an estimated US$ 1.5 billion from all sources combined in 2007. Disbursements from international donors alone increased almost threefold from US$ 250 million in 2004 to US$ 700 million in 2007 and are expected to increase to US$ 1.1 billion in 2008. However, to reach the RBM targets, funding will need to be increased to about four times the total current funding levels.

When community coverage with LLINs is high, protection is given to those sleeping under the mosquito net, as well as to those in the same house and those living nearby (RBM, 2008). The Roll Back Malaria partnership promotes rapid and sustained scale-up and use of LLINs in order to reduce malaria morbidity and mortality. This is one of the many initiatives that Roll Back Malaria supports within the framework of malaria prevention and control. Insecticide-treated nets (ITNs) that need to be retreated with insecticide at home or in the community (once or twice a year or after every three washes) were in common use. LLINs are a relatively new and improved technology. They are designed to be stronger and to last longer, and importantly, they do not need to be treated or retreated on a regular basis. The insecticide is formulated and applied in a way that precludes the need for the insecticide to be replenished often. A long-lasting, insecticide-treated net (LLIN) is a factory-treated net made with netting material that has insecticide incorporated within or bound around the fibres. The net must retain its biological effectiveness without pretreatment for at least 20 washes under laboratory conditions and three years of recommended use under field conditions. LLINs remain effective for the expected lifespan of the net, with no need for retreatment at household or community level (three to five

years). There are now numerous approved LLINs and only these should be used. Today, almost all nets procured by national malaria control programmes are LLINs.

2.3 THEORITICAL LITERATURE

There currently is no generally agreed system to capture and categorize net distribution mechanisms in a standardized manner. Rather than using a closed matrix, we here propose an open system of descriptive categorization. Each ITN delivery mechanism can be uniquely described by six specific criteria allowing flexible combinations between the elements of each category. Several delivery mechanisms can then be combined forming the LLIN delivery strategy in order to achieve scale-up (attack phase) or sustained control, which roughly equate to the terms ñcatch upò and ñkeep upò (Grabowsky, Nobiya and Selanikio, 2005). The first and central category for each delivery mechanism is the channel or outlet which is then further described by population group(s) targeted, duration of distribution, cost to user, choices of net recipient and finally by sectors involved. While elements of the channel and sector can be combined or mixed within a delivery mechanism, the elements of the other categories are mutually exclusive. The categories are defined as follows:

Channel: The delivery channel is described by its endpoints or outlets and includes:

i) Direct community delivery, meaning that the community (or the targeted group within the community) has direct and indiscriminate access to nets outside commercial outlets, either through house to house delivery, or at a specific gathering point which could be a church, school, health facility or any other common meeting place. This channel, when undertaken over a limited period of time, is commonly referred to as a "campaign";

ii) Routine services (generally health services, but could also be others). Access to nets is associated with the utilization of these services;

iii) Outreach activities of health services, such as mobile brigades/clinics or immunization outreach (also referred to as enhanced routine);

iv) Formal retail outlets (shops, pharmacies, supermarkets, etc);

v) Informal retail outlets (mobile vendors, open markets).

Each of these represents a distribution channel that involves several stations through which nets flow such as government supply chain, commercial wholesalers or distributors. Multiple elements of the channel category can be combined within the same delivery mechanism as occurs in voucher schemes.

Duration: this category distinguishes between time-limited and continuous distribution and refers to the time period nets are available to the potential recipient at a specific outlet. We define distribution as continuous if this period is longer than one month. This implies that what is commonly referred to as a ñcampaignò is categorized as time-limited distribution and therefore the term ñcampaignò is used synonymous with a time-limited, community-based distribution. A continuous delivery mechanism on the other hand may be interrupted at times of stock-out or be discontinued after a project ends.

Target: The target group can either be the general population (either national or a limited geographical area) which is termed universal coverage or alternatively a vulnerable biological, social or economic group.

Cost to user: the three mutually exclusive categories are free (or fully subsidized), subsidized to any degree other than fully, and commercially sustainable cost.

Choice: Refers to the net user's ability to a) obtain the net of choice (shape, size and/or colour) and to b) get it when he or she needs it to either cater for additional sleeping places in the family or replace a net which is no longer in the household's possession or cannot be used any longer.

Sector: The public sector refers to local or national government, while the private sector is split into civil society (NGO, faith or community-based organizations) and the commercial sector is comprised of the for-profit health care providers and the LLIN market. We further define a delivery mechanism as a mixed sector approach if there is a significant logistical or human resource contribution beyond financing or manufacturing.

Evaluation criteria

As with other health interventions, LLIN distribution mechanisms and strategies need to be subjected to rigorous effectiveness and cost-effectiveness assessments. In line with criteria suggested by Victoria et al. (2004), we have used the following measures:

Coverage: the principle criterion for achieved coverage at a given point in time following start of net distribution is the proportion of households in the general population with at least one net or ITN and within subgroups of households for targeted distributions. As this indicator does not capture the intra-household net saturation, the average proportion of sleeping places covered, or people to nets ratio within a household would ideally be used as a secondary criterion, but these data were rarely reported and can, therefore, not be considered here. We explicitly do not

consider net use as an outcome, as this involves many additional factors such as behaviour and seasonality that are independent of the performance of the actual net distribution strategy.

Cost: In the context of net delivery mechanisms and strategies, we only considered cost per net delivered to the end user, and not cost-effectiveness measures such as cost per life saved, cost per daily or cost per treated net life, as these latter measures include aspects of the net (ability to prevent malaria and/or durability of the material) which are independent of the distribution mechanism.

Delivery channel: *Community-based*

A total of 25 studies were identified that describe community-based distributions outside of net efficacy studies. Community-based distribution occurs in three ways (Brentlinger, Correia, Chinhacata, Gimbel-Sherr, Mercer, Stubbs, 2007):

i) as a house to house delivery with the number of nets determined according to pre-set criteria,

ii) distribution from one or several delivery points where the community members receive or buy a net without pre-registration, and

iii) a combination of these two approaches, i.e. the households are registered during a house to house activity and are allocated nets which they obtain from a central distribution point immediately thereafter or after a certain time interval. In six cases community-based distributions have been carried out as a continuous activity over longer periods of time from particular delivery points (scenario ii above). All of these were either part of implementation research, smaller scale projects, or social marketing approaches that have since been terminated. Community health workers or community leaders have been used

to sell subsidized nets in Afghan refugee camps in Pakistan, in several communities in Latin America , and in social marketing projects in Kilombero, Tanzania and Sofala and Manica Provinces in Mozambique. In other cases, community-based organizations such as committees or cooperatives have been used for the same purpose in four areas in Kenya, Mexico and Columbia.

The allocation of nets to households varied from one for each person (except children sleeping with their mother) in Sudan (Ritmeijer et al, 2007) to one net per every two persons to 1-4 per family in Uganda to an average of two per household in Ethiopia (Shargie et al, 2008). In the integrated LLIN campaigns nets were targeted at children under 5. In two cases, the target group for the immunization differed from that of the nets, specifically measles catch-up vaccinations in Ghana and Zambia where children up to 14 years were eligible (Grabowsky et al, 2005). Net allocation generally was one net per child under 5 with three exceptions: in Niger, Mozambique and Ghana one net was allocated per mother or household with one or more children under 5 (Macedo, 2006; Amofah et al, 2005). The Nigerian integrated LLIN campaign targeted children and pregnant women with one free net for each sleeping place used by this target group. Among the stand alone campaigns, children were targeted in Kenya while all the others targeted all household members aiming for universal coverage. In Eritrea the target was on average two nets per household but children and pregnant women were given special emphasis (Noor et al, 2007; Nyarango et al, 2006).

ANC and EPI services

For the net distributions through ANC or EPI services found in this literature search, delivery was in principle continuous, i.e. the recipient had the opportunity to obtain a net at any

service outlet as long as they fulfilled the eligibility criteria. Similarly, all used targeted distribution. Direct free distribution of nets during ANC services was reported in Eritrea, Burkina Faso and Kenya (Guyatt et al, 2002). This was implemented by the public sector alone or in collaboration with NGOs. In Lawra district, Ghana they were sold at a subsidized price in line with national policy. Direct delivery of nets at the point of service was also implemented in Malawi and Kenya. In both cases, nets were sold at highly subsidized prices through a public/CSO sector social marketing project with the target group expanded to include mothers bringing their children for immunization. The alternative to direct delivery of nets during ANC services is to distribute a voucher, which then provides a price subsidy for the purchase of an ITN at retail outlets participating in the voucher scheme. Pilots or geographically limited implementation have been conducted in Ghana, Uganda and Tanzania, the latter being the only country that then went on to implement the voucher scheme at a national scale. All these and other voucher schemes were implemented involving all three sectors, public, CSO and commercial (Müller et al, 2008).

Retail outlets

It has been repeatedly shown that commercial delivery mechanisms, in particular the informal retail channels, represent the most important source of nets in many countries and settings. This may not be quite the case for LLIN, as there were very few sources other than social marketing projects found in our literature search describing commercial delivery mechanisms (Hill et al, 2006). Commercial deliveries are continuous. The un-assisted commercial sector sold nets to anybody who was able to buy at a profit. There was normally full consumer choice on when to purchase the net and the type of net. This situation differed only when the commercial sector was

supported by the public and/or CSO sectors in a ñtotal market approachò with either a voucher scheme, or in the classical social marketing approach, the CSO delivered nets through formal commercial retail outlets. In these cases net sales were mostly subsidized to some degree, although at times the support by the CSO only applied to the distribution and marketing cost but not the price to the customer. The target group was restricted in voucher schemes with vouchers given either to pregnant women during ANC or children during a vaccination campaign (Brentlinger et al, 2007).

Campaigns targeted only at children under five will not achieve full intra-household coverage even when the allocation is one net per child rather than one per household with any children. This is another reason why this type of distribution does not seem adequate if universal access is the objective. Some campaigns targeting the general population have given nets according to sleeping places found, such as in Sudan or number of family members such as in Uganda and Vietnam. These are likely to have achieved full or high intra-household coverage at least initially even if it was not documented based on findings from recent surveys in Nigeria, Uganda and Sudan. For other studies in the review, only an average number of nets per household was given, e.g. two per household which seems to match the mean number of people sharing a net. However, for the actual distribution at household level, it is critical how this average is translated into an allocation algorithm, as survey data on the distribution of number of members per household strongly suggests that just applying the mean to every household will leave a high proportion of families under- and some over-supplied. Additional operational research in this area is clearly needed before any firm conclusions can be drawn (Brentlinger et al, 2007).

Two recent developments influence the debate on net distribution strategies:

The maturation of the long-lasting insecticidal net (LLIN) technologies and ii) the strategic shift from ITN as primarily for the protection of individuals (high risk groups), to LLIN as a tool for vector control for which universal access to the entire population in the target area is essential. Both are closely linked with the renewed interest in the prospects of elimination and eradication of malaria. First, with five LLIN products now having at least temporary recommendation from the WHO Pesticide Evaluation Scheme, LLIN have become accepted as the current standard, replacing conventionally treated nets. This creates new challenges and debates, namely around ways to support and subsidize LLIN sales in the commercial market vis-à-vis conventional mosquito nets, and on best strategies for LLIN replacements in the public sector. Second, by defining LLIN as one of the key vector control elements on the road to potential malaria elimination, the malaria control community needs to reconsider how best can universal access be achieved; which delivery strategies or mix of approaches is best suited for the initial attack or scale-up phase; and which approaches would work best in the sustained control phase (Brentlinger et al, 2007).

2.3.1 THEORIES OF BEHAVIOURAL CHANGE COMMUNICATION

2.3.1.1 The Cultivation or Enculturation Theory

Gerbner, Gross, Signorelli and Morgan propounded the Cultivation Theory which asserts that the mass media, especially television, exerts a tremendous influence by altering individualsô perception of reality. Television serves as a major medium through which most society members acquire consciousness, beliefs, norms and values. According to Gerbner and Gross, (1976) television ñenculturatesò most people to develop standardized roles and behaviour. American

media content (especially films) for instance are changing the world into an American village in speech, comportment, dressing crime and politics (Okenwa, 2002).

An assumption of ñcultivationò or ñenculturationò theory is that repeated exposures to consistent media portrayals will influence peopleôs perceptions of the subject matter. In this study, the mass media have been used for messages on malaria and its control programmes. It is hoped that the masses are aware of LLINs.

2.3 EMPIRICAL STUDIES

Researchers estimate that malaria kills between 2 and 3 million people worldwide every year and its transmission continues to increase globally. Of these deaths around 90% occur in sub-Saharan Africa. Subpopulations especially vulnerable to malaria infection include children and pregnant women. Children account for 90% of the life-threatening cases in sub-Saharan Africa, and an African child dies of the disease every 30 seconds. Additionally, pregnant mothers are highly susceptible to malaria infection because of a temporary depression in their immune systemsô defenses . Once a pregnant woman has malaria, she and her child are at an increased risk for developing adverse health outcomes due to maternal fever, placental malaria which decreases nutrient flow to the fetus, and maternal anemia which has been associated with low birth weight. Studies have suggested that anywhere between 3 and 8% of infant mortality is due to maternal malaria, as infants of mothers with the disease are at an increased risk for neonatal mortality, premature labor, reduced fetal weight, placental infection and stillbirth (Haghdoost et al. 2007).

The economic and social burdens that malaria creates can be crippling for countries throughout sub-Saharan Africa. Such burdens include the need for large investments in medical

care, as well as experiencing sustained losses within the labor force. A countryôs trade, tourism and foreign investments can be severely damaged by changes in economic behavior associated with high rates of the disease. Families in disease-burdened countries tend to experience a reduction in savings, migration between malarious and non-malarious regions, as well as school attendance for children. Many individuals and households will lose income. These added stresses on society make it more difficult, yet all-the-more pressing, for countries to implement programmes that will improve the publicôs health (Haghdoost et al. 2007).

The introduction of insecticide-treated nets (ITNs) as a means of malaria control has been extremely successful in reducing incidence rates of the disease. The nets have been described as the ñmost powerful malaria control tool to be developed since the advent of indoor residual spraying (IRS) and chloroquineò (Hill et al, 2006). Studies on these treated nets have reported significant reductions in malaria-related deaths and malaria transmission. One study in Gambia, reported that an 86% bednet coverage reduced child-under-five malaria mortality rates by 63%. Another study in Gambia reported at least a 50% reduction in the number of malaria cases for the general population after using bednets.

WHO is also making a move to scale up the distribution and use of LLINs within sub-Saharan Africa. In the past, efforts have been focused on distributing bednets to vulnerable subpopulations such as children under five and pregnant women. However, with the netsô success WHO is now recommending full coverage of populations at risk to better protect the entire community (WHO, 2007). Therefore the scaling up of net coverage will benefit people in the community who do not have or do not use bednets. WHO is pleased with this approach to malaria prevention as it does not rely on the use of DDT and is therefore consistent with the

priorities outlined by international conventions such as the Stockholm Convention on Persistent Organic Pollutants (Ministries of Health and of Environment of Madagascar, 2008).

In 2006 and 2007, 22 countries carried out surveys of mosquito net ownership and use, 18 in the African Region. The 18 African countries were inhabited by 276 million people, 43% of the African population at risk of malaria. Surveys carried out in 2007 in the Democratic Republic of Congo, Nigeria and Rwanda were unpublished at the time of completing this report. In the surveyed African countries, an average of 34% (mean weighted for population at risk) of households owned an LLIN (18 countries). Only 23% of children slept under an LLIN (18 countries), as compared with the target of 80%. In a smaller subset of 8 countries, an average of 27% of pregnant women slept under an LLIN. As indicated by NMCP data (above), there was wide variation among countries in LLIN possession and use. The percentage of households that owned an ITN was greater than or equal to 40% in 8 countries in 2006ï 2007. In the 18 surveyed countries, there was no significant difference in the proportion of households that owned an ITN in rural (26% on average) and urban areas (34%). There were only six countries in which more than 30% of children under 5 years slept under an ITN (Ethiopia, Gambia, Guinea-Bissau, Niger, Sao Tome and Principe, and Togo), and only Niger reported that more than 50% of children slept under an LLIN on the night preceding the survey (Ministries of Health and of Environment of Madagascar, 2008).

The percentage of women sleeping under a LLIN in the 8 surveyed countries ranged from 10% in Uganda to 48% in Niger. While these surveys reveal that the coverage of ITNs in African populations was nowhere near the target of 80% by 2006, consecutive surveys in selected countries show how household ownership and use of LLINs increased over the preceding 6ï 7 years, notably in Ethiopia, Gambia, Guinea-Bissau, Sao Tome and Principe, Togo and Zambia.

Only four countries outside the African Region did household surveys in 2006. An ITN was ownedby 18% of households in Djibouti, 12% in Somalia, 18% in Sudan and 19% in Viet Nam. The proportions of children that slept under an LLIN were different, but also low: 1% in Djibouti, 9% in Somalia, 28% in Sudan and 5% in Vietnam (Ministries of Health and of Environment of Madagascar, 2008).

Nationwide household surveys also show that LLIN use among children under five years of age (Figure 1.2) and pregnant women has also increased significantly. Use among children under five rose from an average of 21 percent in baseline surveys completed in 2004ï 2006 to an average of 50 percent in surveys completed in 2007-2010; use by pregnant women rose similarly from 18 to 47 percent. Nationwide household surveys also show that LLIN use among children under five years of age and pregnant women has also increased significantly. Use among children under five rose from an average of 21 percent in baseline surveys completed in 2004ï 2006 to an average of 50 percent in surveys completed in 2007-2010; use by pregnant women rose similarly from 18 to 47 percent. An analysis based on households that own at least one LLIN showed even higher net use, ranging from 42 to 76 percent in children under five years of age and from 46 to 85 percent in pregnant women across these seven countries. These results highlight the need to focus on increasing access to and ownership of LLINs (WHO, 2011).

The challenge of óhang-upô becomes evident in the most recent Malaria Indicator Surveys (MIS) of Senegal and Liberia. In Senegal, only 27.9% of children below 5 years of age (<5s) reportedly slept under an LLIN the night before the survey. Unfortunately even when there was an LLIN in the house, only 41.5% of those <5 slept under one. The same pattern holds for women of reproductive age (15.29 years of age) and pregnant women. The same problem was found in Liberia with 26.4% of <5s overall and 51.4% who live in a house with an LLIN actually

sleeping under one. After a massive net campaign in Mali in 2008, the Ministère de la Santé reported that 80% of households with <5s now owned a net. Ironically the press release noted further that 51% of <5s actually slept under an ITN the night previous to a follow-up survey. The ministry appeared happy that this was an increase of over 27% from 2006 levels, but it is still far from targets (Ministries of Health and of Environment of Madagascar, 2008).

The Liberian and Senegalese MIS reports show a few differences among users in houses with nets. Among the <5s in both countries, reports of sleeping under an ITN decreased as childôs age increased. Sex differences were not observed. In Senegal there was significantly greater use of ITNs by urban <5s in houses with nets than in rural areas. In Liberia, among pregnant women in houses with nets more women without education used them. In Senegal it was women with secondary or higher education who were more likely to use the nets. Otherwise there were few clear patterns of demographic factors influencing net use. Thus, there is the need to examine social and cultural factors more closely (Eng, Thwing, Wolkon et al, 2010).

In three ethnically different communities in Sri Lanka after 300 000 ITNs had been distributed and varied information or advice given at the time the nets were received according by ethnic group, it was observed that even for the majority population where results were best, information recall was poor as only 24% said they were told not to give the net away, and 6% remembered that they should use it only for sleeping. Only half of these majority ethnic group respondents recalled instructions about washing the nets, while the two minority groups had a lower recall rate. Reported daily use of nets ranged from 24% to 78% to 92% among the three groups (Eng, Thwing, Wolkon et al, 2010).

In the five countries they studied (Eng, Thwing, Wolkon et al, 2010), <5s were the group most likely to fall into category 4. For these children, the proportion in houses with nets who did not sleep under them ranged from 4% to 16%. The most common reason given for non-use where nets were present was not enough nets for the household. In Madagascar and Sierra Leone where data were available on all household members, adult men had low net use.

Report in the *Los Angeles Times* noted, ódata suggest that, at least in some places, nearly half of Africans who have access to the nets refuse to sleep under them.ô She expressed the concern that donors are befuddling communities with ógifts that many neither want nor use.ô She reports that donors believe that inadequate health information may be one reason for this (Eng, Thwing, Wolkon et al, 2010).

Iwashita et al (2010) found that the structure of sleeping arrangements inside the home played a major role in determining who slept under a net in western Kenya. Availability of suitable locations for hanging nets presented a problem. Ironically, house residents themselves did not perceive this problem, but instead explained non-use by perceived absence of mosquitoes at the time. Specifically, those who slept in sitting rooms, as opposed to bedrooms were less likely to use a net, even when there were theoretically enough nets to cover everyone. These sleeping arrangements related directly to the number of rooms in a dwelling. It was stated that nets in non-bed sites interfered with daily activities and thus were not used in those locations.

A qualitative study in south-western Burkina Faso (Iwashita et al, 2010) indicated that this increased use declined after several months after initial distribution. One factor was the cultural perception of malaria-like illness. Despite using nets, people still suffered from illnesses they labelled as ómalaria.ô Lack of perceived net effectiveness also was thought to relate to the

perception that malaria-like illnesses were caused by things like certain foods, and these could not be prevented by sleeping under a net. Net use also dropped at times when people believed that, ôthere are not enough mosquitoes.ô Similar to findings by Iwashita et al (2010), people in Burkina found it awkward to use nets in rooms that had multiple uses ï sleeping spaces with mats at night, living and cooking spaces by day. Distribution of nets without taking into account these perceptual and social factors does not bode well for actual use.

Aside from social and cultural factors influencing non-use of ITNs, there are blatant cases of net misuse. Iwashita et al (2010) observed that of 1040 LLINs distributed in six villages, 16.3% were being used for drying fish. One reason given for using LLINs to dry fish was because ôthe nets were extra.ô A previous survey suggested that in fact houses in these villages did have at least two nets each, but that is not a reason to use nets for the wrong purpose as excess in one village might have filled a gap in another village.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the methods and procedure to be used in carrying out this research. The research methodology is discussed under the following sub-headings: research design, area of study, nature and sources of data, population of the study, sample size, sampling technique, data collection instrument, validation of instrument, reliability of instrument, data collection procedure, and method of data analysis

3.2 RESEARCH DESIGN

Research design is the plan, structure and the strategy of investigation conceived so as to obtain answer to the research questions and control variance. Therefore, research design is a blue print that guides the researcher in conducting his study. They could manifest in three major ways viz; survey, experimental, and ex-post facto designs (Osuala, 2007).

The study adopted an analytical survey research design. This research design attempts to describe and explain why certain situations exist. In this approach, two or more variables usually are examined to test research hypotheses. The results allow researchers to examine the interrelationships among variables and to draw explanatory inferences. The analytical survey research technique allows the researcher to examine many variables such as demographic, attitudinal, behavioral, motivational etc.

The analytical survey research does not allow the manipulation of independent variables and random assignment of subjects to treatment and control groups as in laboratory

experiments. Without control of independent variable variation, the researcher cannot be certain whether the relations between independent and dependent variables are causal or non causal (Onodugo, Ugwuonah and Ebinne, 2009).

3.3 AREA OF STUDY

Enugu State is one of the States in the eastern part of Nigeria. The State shares borders with Abia State and Imo State to the south, Ebonyi State to the east, Benue State to the northeast, Kogi State to the northwest and Anambra State to the west. Enugu, the capital city of Enugu State, is approximately 2½ driving hours away from Port Harcourt, where coal shipments exited Nigeria. Enugu is also located within an hour's drive from Onitsha, one of the biggest commercial cities in Africa and 2 hours drive from Aba, another very large commercial city, both of which are trading centers in Nigeria. The average temperature in this city is cooler to mild (60 degrees Fahrenheit) in its cooler months and gets warmer to hot in its warmer months (upper 80 degrees Fahrenheit) and very good for outdoor activities with family and friends or just for personal leisure.

Enugu has good soil-land and climatic conditions all year round, sitting at about 223 metres (732 ft) above sea level, and the soil is well drained during its rainy seasons. The mean temperature in Enugu State in the hottest month of February is about 87.16 °F (30.64 °C), while the lowest temperatures occur in the month of November, reaching 60.54 °F (15.86 °C). The lowest rainfall of about 0.16 cubic centimetres (0.0098 cu in) is normal in February, while the highest is about 35.7 cubic centimetres (2.18 cu in) in July (Emodi, 2012).

There are 17 Local Governments Areas in Enugu State which Enugu east Local Government Area is one of them. There are twenty four (24) towns that made up of Enugu East

which are Agbogazi, Ako, Akpoga, Alulu, Amorji, Amokpo, Azama, Edem, Effokwe, Emene, Ibeagwa, Ije, Amaowelle, Nbulunjodo, Nchetanche, Neke, Odenigbo, Nekeuno, Ngwuomu, Nkunibo, Nokpa, Obinagu, Onuogba and Onyohu. The researcher could only lay hands on a brief oral history of some of them.

IBAGWA: Ene *nwa* Udara migrated to Ibagwa Nike in the 10th century. He married and had five sons namely: Oshim Ene, Aneke Ode, Ogavene, Agode and Eze Neke. It was these five sons who founded the five most important lineages in Ibagwa. The three sons of Ibagwa were Ibagwa Aka, Ibagwa Ani and Alo. Ibagwa is the eldest community in Nike land.

AMORJI: From Igala in the present-day Kogi State, the female ancestor of Amorji migrated to Onu Nnugbu in Ibagwa before finally settling at her present home.

EDEM: Edem people are descenants of Edem Ututu (Edem from morning) of Nike land, who did not migrate from Edem Ani in Nsukka (contrary to speculations). The name Edem Ani is coincidence of name.

UGWUOGO: The people of Ugwuogo were believed to have originated from Uburu. This was informed by the fact that Uburu was one of the trading nerve-centres of Nike before the coming of the whiteman. Originally, Ugbuogo was divided into five units, namely: Umunonu, Umuagbo, Umunameze, Amakpaka and Obinagu. However the number had increased with addition of Ugwunkwo, Adaeze, Okpuho and Ogbogodo.

AKPUOGA: These people are linked to Umu Nshokene in Iji. They are believed to be descendants of Chiene who hails from Nshokene in Iji.

AGBOGAZI: Agbogazi people moved to their present domain when Ugbahu was encroaching on Nike land. As a result of this development, a man suggested that they should migrate to a place where there were guinea fowls, hence the name Agbogazi which literally means the domain of guinea fowl. It is an authonomous community now.

NKWUBO: The people were said to have migrated from Amorji, while Nchatancha, Onuogba and other villages in Mburu Ujodo came from Iji.

EMENE: The ancestor of Emene was a child of Nike and Akpawfu war. Nike oral tradition has it that 28 people of Nike were poisoned by Akpawfu. Nike was enraged by this incident and consequently invaded Akpawfu and prevented its people from worshipping Anike deity. Also nobody from Emene was allowed to answer Anike as a name after killing Akpachi-Akpa, their war ï hero. The skull of this war-hero was used by Atama as a worship throne.

NEKE UNO: The people of Neke-Uno were owned by the people of Neke, who resided in the northern part of Nike prior to their defeat and subsequent expulsion in the nineteenth century. When their masters were expelled, they occupied the latterôs domain.

Electricity supply is relatively stable in Enugu and its Environs. The Oji River Power Station (which used to supply electricity to the defunct Eastern Nigeria) is located in Enugu State. With the deregulation of electricity generation in Nigeria, and the proposed privatization of the National Electric Power Authority (NEPA), the State Government would assist private investors to negotiate the take-over and reactivation of the Oji Power Station. This is more so with the proximity of the Enugu coal mines to the power station, a driving distance of about 20 minutes. There are also traces of crude oil in Ugwuoba, in the same Oji-River Local Government area of the state. The state will also negotiate with investors interested in investing in the coal

mining in Enugu. The coal industry used to be one of the biggest employers of labour in the state and the state is looking to attract investors in the industry (Emodi, 2012).

Every community in Enugu East LGA has at least one Primary School and one Secondary school, funded and run by the Enugu State Government. There may be private nursery, primary and secondary schools in the community. Tertiary educational institutions in Enugu East LGA include Caritas University, Amorji-Nike (mission), Our Saviour Institute of Science and Technology, Owo Campus.

3.4 NATURE AND SOURCES OF DATA

The researcher made use of primary data collected by use of structured questionnaire administered to households in Enugu East LGA to provide raw data on the research problems. Secondary information were sourced from published and unpublished materials: textbooks, magazines, newspapers, journals, and research projects related to the study.

3.5 POPULATION OF STUDY

The study population comprises of the entire household in Enugu East LGA. Enugu East LGA is made up of five (5) districts, namely, Mbulujodo, Mbulu Oweghe, Mbulu Iyiukwu, Emene and Trans Ekulu. There are 824,632 households in Enugu State by 2006 national population census (NPC, 2006). The population of Enugu East LGA was 131,214 (male) and 145,905 female, bringing the total to 277,119. Enugu East LGA comprises 29% of the entire households in Enugu State. Twenty-nine percent (29%) of 824,632 is 239,143. Therefore, the total population was 239,143 households (NBS/CBN/NCC, 2007). Projecting the population by 2.8% annual growth rate will give 298,265 for 2014.

3.6 SAMPLE SIZE

The sample size for the study was determined using Taro Yamane formula (1972):

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size

N = population

e = sampling error (5%)

1 = constant

$$n = \frac{298{,}265}{1 + 298{,}265\ (0.05)^2}$$

$$n = \frac{298{,}265}{1 + 745.6625}$$

$$n = 399.46$$

Therefore, the calculated sample size for the study is 400 households. Because there are 24 households, 408 (24 x 17) was used, so that 17 households would be selected from each community.

3.7 SAMPLING TECHNIQUE

A combination of purposive and snowball sampling techniques was adopted. An household that is able to give the required information was identified in each community. After administering the questionnaire to the selected household, its representative will help to recommend the next household that is able to give the required information.

According to Eboh (2009), a purposive sample can be based on the capacity of the respondent to supply the required information. Osuala (2007) submits that snowball sampling technique when a survey research target can help to identify the next target.

3.8 INSTRUMENT FOR DATA COLLECTION

Data collection was done by means of questionnaire constructed by the researcher. It was drawn strictly based on extensive literature search on use of Long Lasting Insecticide Treated Nets (LLINs). The questionnaire was divided into two sections. Section A addressed the demography of the respondents, while Section B addressed the LLIN access and use among households. Section B has questions with 4-point likert-scale answer options (Strongly agree SA 4; Agree A 3; Disagree D 2; Strongly disagree SD 1).

3.9 VALIDATION OF THE INSTRUMENT

The validity of a measuring instrument is the extent to which the instrument measures what it is intended to measure. Face validity on the other hand is achieved by superficial examination of the instrument by experts, authorities or competent source to ensure that the content of the instrument is truly asking the required questions to get answers to the problem of the study. The researcher will then base his judgment on the certification of the instrument by experts that it is actually measuring what it is supposed to measure. The instrument was given to colleagues, lecturers and then the supervisor. The resulting useful criticisms corrections and additions made by these experts further improved these instruments and increased the content validity.

3.10 RELIABILITY OF THE INSTRUMENT

A pilot study was carried out to ensure reliability of the instrument. Thirty questionnaires were tested for internal consistencies of responses, using a measure of reliability called Cronbachôs alpha.

The formula is as follows:

Ŭ=k (cov/var)

1+ (kī 1) (cov/var)

Where K = Number of items on the survey

Cov = Average inter-item covariance

Var = Average item variance

1 = Constant

The result revealed that the Cronbachôs alpha coefficient (Ŭ) of (0.854), indicates a very strong reliability. Therefore, the instrument was reliable for the study.

3.11 METHOD OF DATA ANALYSIS

This section is dedicated to defining how the data was analysed to achieve each of the study objectives. Statistical descriptive tools were used to present the data.

Average mean score (AMS) technique was used to analyse the likert-scale data to ascertain the level of access to, use of LLINs and the effects of behavioural change on the use of LLIN among households in EELGA, and also to test the hypotheses. The decision value (DV) was calculated as the average of the likert scales,

$$\frac{4 + 3 + 2 + 1}{4} = \frac{10}{4} = 2.5$$

The calculated value (CV) was obtained from

$$CV = \frac{\times Fx}{F}$$

Where F is frequency

x is scale value

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

In this section, results are presented using simple statistical tools, such as percentage tables. They were analysed by use of Average Mean Score (AMS) technique, which also tested the hypotheses.

4.2 DISTRIBUTION OF QUESTIONNAIRE

Table 4.2.1 shows the distribution of questionnaire.

Table 4.2.1: Questionnaire distribution and retrieval

S.No.	EELGA Communitites	No. administered	No. returned
1.	Agbogazi	17	17
2.	Ako	17	17
3.	Akpoga	17	17
4.	Alulu	17	17
5.	Amoji	17	17
6.	Amokpo	17	17
7.	Azama	17	17
8.	Edem	17	17
9.	Effokwe	17	17
10.	Emene	17	17
11.	Ibeagwa	17	17
12.	Ije	17	17
13.	Amaowelle	17	17
14.	Nbulunjodo	17	17
15.	Nchetanche	17	17
16.	Neke	17	17
17.	Odenigbo	17	17
18.	Nekeuno	17	17
19.	Ngwuomu	17	17
20.	Nkwubo	17	17
21.	Nokpa	17	17
22.	Obinagu	17	17
23.	Onuogba	17	17
24.	Onyohu	17	17
	Total	**408**	**408**

Source: Field Survey 2015

All 17 questionnaires adminstered to respondents in each of the 24 communities were retrieved. This was possible because on-the-spot administration approach was used.

4.3 BIODATA OF RESPONDENTS

Table 4.3.1 shows distribution of respondents by sex

Table 4.3.1: Distribution of respondents by sex

Gender	**No. of respondents**	**Percentage**
Male	170	41.7
Female	238	58.3
Total	**408**	**100**

Source: Field Survey 2015

About 42% were male, while about 58% were female. Table 4.3.2 shows distribution of respondents by marital status.

Table 4.3.2: Distribution of respondents by marital status

Marital status	**No. of respondents**	**Percentage**
Married	202	49.5
Single	18	4.4
Widowed	109	26.7
Separated	79	19.4
Total	**408**	**100**

Source: Field Survey 2015

About 50% of respondents were married, 26.7% were widowed,19.4% were separarted, and 4.4% were singled. Table 4.3.3 shows distribution of respondents by age.

Table 4.3.3: Distribution of respondents by age

Age	**No. of respondents**	**Percentage**
Below 30years	63	15.4
31-50 years	157	38.5
51-70 years	109	26.7
71-90 years	68	16.7
Above 90 years	11	2.7
Total	**408**	**100**

Source: Field Survey 2015

About 39% of the respondents were aged 31-50 years. This is the mode age bracket. Other age brackets were 51-70 years (26.7%), 71-90 years (16.7%), 30 years and below (15.4%), and 91 years and above (2.7%). Table 4.3.4 shows distribution of respondents by highest educational level. The highest fraction of respondents (26.7%) had senior secondary education, followed by 23.5% (tertiary education), 23.3% (junior secondary education), 21.8% (primary education), and only 4.7% of respondents did not attend school.

Table 4.3.4: Distribution of respondents by highest educational level

Level of Education	No. of Respondents	Percentage
Primary	89	21.8
Junior Secondary	95	23.3
Senior Secondary	109	26.7
Tertiary	96	23.5
None	19	4.7
Total	**408**	**100**

Source: Field Survey 2015

Table 4.2.5 shows distribution of respondents by major occupation.

Table 4.2.5: Distribution of respondents by major occupation

Occupation	No. of Respondents	Percentage
Civil servant	91	22.3
Artisan	68	16.7
Trader	138	33.8
Others	111	27.2
Total	**408**	**100**

Source: Field Survey 2015

Respondents were traders (33.8%), unspecified occupations (27.2%), civil servants (22.3%), and artisans (16.7%).

4.4 ACCESS TO LLIN

Table 4.4.1 shows access to LLIN by households.

Table 4.4.1: Access to LLIN by households

Response	**Scale, x**	**Frequency, F**	**Fx**	**Percentage**
SA	4	158	632	38.7
A	3	150	450	36.8
D	2	69	138	16.9
SD	1	31	31	7.6
Total		**408**	**1,251**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,251/408 = 3.1

About 39% of respondents strongly agreed that there was significant access to LLIN by households, whereas about 37% agreed. Only about 17% and 7.6% disagreed and strongly disagreed respectively. Thus, access to LLIN was significant among households in Enugu East Local Gocal Government Area of Enugu State.

4.5 USE OF LLIN

Table 4.5.1 shows the use of LLIN.

Table 4.5.1: Use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	64	256	15.7
A	3	21	63	5.1
D	2	154	308	37.7
SD	1	169	169	41.4
Total		**408**	**796**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 796/408 = 1.95

Only about 16% of respondents strongly agreed that there was significant use of LLIN by households, whereas about 5.1% agreed. About 38% and 41.4% disagreed and strongly disagreed respectively. Thus, use of LLIN was not significant among households in Enugu East Local Gocal Government Area of Enugu State.

4.6 BEHAVIOURAL CHANGE EFFECT ON USE OF LLIN

Table 4.6.1 shows behavioural change effect on the use of LLIN.

Table 4.6.1: Behavioural change effect on the use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	165	660	40.4
A	3	135	405	33.1
D	2	56	112	13.7
SD	1	52	104	12.8
Total		**408**	**1,281**	**100.**

Source: Field Survey 2015 DV = 2.5, CV = 1,281/408 = 3.1

About 40.4% of respondents strongly agreed that behavioural change had significant effect use of LLIN by households, whereas about 33.1% agreed. Only about 13.7% and 12.8% disagreed and strongly disagreed respectively. Thus, behavioural change had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

4.7 FACTORS AFFECTING THE USE OF LLIN

Table 4.7.1-7 shows the factors affecting the use of LLIN.

Table 4.7.1: The effect of habit on use of LLIN

Response	**Scale, x**	**Frequency, F**	**Fx**	**Percentage**
SA	4	146	584	35.8
A	3	178	534	43.6
D	2	69	138	16.9
SD	1	15	15	3.7
Total		**408**	**1,271**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,271/408 = 3.1

About 35.8% of respondents strongly agreed that habit had significant effect on use of LLIN by households, whereas about 37% agreed. Only about 16.9% and 3.7% disagreed and strongly disagreed respectively. Thus, had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.2 shows the effect of apathy to Government Programmes on use of LLIN.

Table 4.7.2: Effect of apathy to Government Programmes on use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	149	596	36.5
A	3	168	504	41.2
D	2	71	142	17.4
SD	1	20	20	4.9
Total		**408**	**1,262**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1262/408 = 3.1

About 36.5% of respondents strongly agreed that apathy to government programmes had significant effect on the use of LLIN by households, whereas about 41.2% agreed. Only about 17.4% and 4.9% disagreed and strongly disagreed respectively. Thus, apathy to government programmes had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.3 shows the effect of fear of side effects on use of LLIN

Table 4.7.3: Effect of fear of side-effects on use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	151	604	37
A	3	184	552	45.1
D	2	61	122	15
SD	1	12	12	2.9
Total		**408**	**1,290**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,290/408 = 3.2

About 37% of respondents strongly agreed that fear of side-effects had significant effect on use of LLIN by households, whereas about 45.1% agreed. Only about 15% and 2.9% disagreed and strongly disagreed respectively. Thus, fear of side-effects had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.4 shows the effect of structure of sleeping arrangement inside the home on use of LLIN.

Table 4.7.4: Effect of structure of sleeping arrangement inside the home on use of LLIN

Response	**Scale, x**	**Frequency, F**	**Fx**	**Percentage**
SA	4	153	612	37.5
A	3	174	522	42.6
D	2	53	106	13
SD	1	28	28	6.9
Total		**408**	**1,268**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,268/408 = 3.1

About 37.5% of respondents strongly agreed that the structure of sleeping arrangement inside the home had significant effect on use of LLIN by households, whereas about 42.6% agreed. Only about 13% and 6.9% disagreed and strongly disagreed respectively. Thus, the structure of sleeping arrangement inside the home had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.5 shows the effect of interference of nets in non-bed sites on use of LLIN.

Table 4.7.5: Effect of interference of nets in non-bed sites on use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	152	608	37.2
A	3	173	519	42.4
D	2	53	106	13
SD	1	30	30	7.4
Total		**408**	**1,263**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,263/408 = 3.1

About 37.2% of respondents strongly agreed that interference of net on non-bed sites had significant effect on use of LLIN by households, whereas about 42.4% agreed. Only about 13% and 7.4% disagreed and strongly disagreed respectively. Thus, interference of net on non-bed sites had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.6 shows the effect of apparent absence of mosquitoes on use of LLIN.

Table 4.7.6: Effect of apparent absence of mosquitoes on use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	145	580	35.5
A	3	172	516	42.2
D	2	61	122	15
SD	1	30	30	7.3
Total		**408**	**1,248**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,248/408 = 3.1

About 35.5% of respondents strongly agreed that apparent absence of mosquitoes had significant effect on use of LLIN by households, whereas about 42.2% agreed. Only about 15% and 7.3% disagreed and strongly disagreed respectively. Thus, apparent absence of mosquitoes had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

Table 4.7.7 shows the effect of perceived net ineffectiveness on use of LLIN.

Table 4.7.7: Effect of perceived net ineffectiveness on use of LLIN

Response	Scale, x	Frequency, F	Fx	Percentage
SA	4	144	576	35.3
A	3	169	507	41.4
D	2	71	142	17.4
SD	1	24	24	5.9
Total		**408**	**1,249**	**100**

Source: Field Survey 2015 DV = 2.5, CV = 1,249/408 = 3.1

About 35.3% of respondents strongly agreed that perceived net ineffectiveness had significant effect on use of LLIN by households, whereas about 41.4% agreed. Only about 17.4% and 5.9% disagreed and strongly disagreed respectively. Thus, perceived net ineffectiveness had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

4.8 TEST OF HYPOTHESES

The DV (2.5) AND CV for each hypothesis were compared as in Table 4.7, in order to take a decision.

Table 4.8: Hypotheses testing table

H_o	DV	CV	Remark	Decision
1. There is no significant access to LLIN by households.	2.5	3.1	CV > DV	Null hypothes rejected.
2. The use of LLIN is not significant in households.	2.5	1.95	DV > CV	Null hypothes accepted.
3. Behavioural change has no significant effect on the use of LLIN among households in EELGA.	2.5	3.1	DC > CV	Null hypothes rejected.
Effects of behavioural change indicators investigated				
i. Habit of sleeping without mosquito nets limits use of LLIN by households.	2.5	3.1	CV > DV	Null hypothes rejected.
ii. Apathy to Government programmes limit LLIN use by households.	2.5	3.1	CV > DV	Null hypothes rejected.
iii. Fear of side-effects limits use of LLIN by households.	2.5	3.2	CV > DV	Null hypothes rejected.
iv. Structure of sleeping arrangements inside the home limits use of LLIN among households	2.5	3.1	CV > DV	Null hypothes rejected.
v. Nets in non-bed sites interfered with daily activities and limits use of LLIN by households	2.5	3.1	CV > DV	Null hypothes rejected.
vi. Perceived absence of mosquitoes limits use of LLIN by households	2.5	3.1	CV > DV	Null hypothes rejected.
vii. Perceived net ineffectiveness limits use of LLIN by households	2.5	3.1	CV > DV	Null hypothes rejected.

Source: Field Survey 2015

Null Hypothesis 1: There is no significant access to LLIN by households in EELGA.

The CV obtained was 3.1, which was greater than DV (2.5). Thus, the null hypothesis was rejected for the alternative hypothesis: There is significant access to LLIN by households in EELGA.

Null Hypothesis 2: There is no significant use to LLIN by households in EELGA.

The CV obtained was 1.95, which was less than DV (2.5). Thus, the null hypothesis was accepted.

Null Hypothesis 3: Behavioural change has no significant effect on the use of LLIN among households in EELGA.

The CV obtained was 3.1, which was greater than DV (2.5). Thus, the null hypothesis was rejected for the alternative hypothesis: Behavioural change has significant effect on the use of LLIN among households in EELGA.

Seven (7) behavioural change indicators (i-vii) had their corresponding null hypothesis tested for each of the indicators. The CV obtained was 3.1 for each of the parameters, and therefore, was greater than DV (2.5). This was a strong internal validity in support of effect of behavioural change on the use of LLIN by households in EELGA.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 ACCESS TO LONG LASTING INSECTICDE-TREATED NET BY HOUSEHOLDS IN ENUGU EAST LOCAL GOVERNMENT AREA

The study found that access to LLIN was signficant. This is not surprising, considering the amount of publicity devoted to awareness creation and raising to ensure significant (if not total) coverage for LLIN, which has lingered for years running as mounted by various global programmes on malaria elimination. Besides, LLIN is distributed *pro bono*.

5.2 USE OF LONG LASTING INSECTICDE-TREATED NET BY HOUSEHOLDS IN ENUGU EAST LOCAL GOVERNMENT AREA

The study found that use of LLIN was not significant by households in EELGA. Elsele et al (2009) reported that, in order to reduce the burden of malaria disease, everyone should sleep under a LLIN. Thus, in April 2000, RBM and African Heads of states established the ñAbuja targets,ò which includes LLIN use by at least 60% and above of pregnant women and under-fives in Africa by 2005. Ten (10) years later (2015), the significant access found above has not translated to significant use. Thus, Abuja targets has not achieved insurance that people who receive the nets actually sleep under them on a regular basis. Significant presence of LLIN in households exists, but not significant use by vulnerable populations.

Since sufficient awareness of LLIN is reported, insignificant use is attributable to habits or behavioural change. The messages may not have effected behavioural change, which the next objective sought to investigate.

5.3 BEHAVIOURAL CHANGE EFFECT ON USE OF LONG LASTING INSECTICDE-TREATED NET BY HOUSEHOLDS IN ENUGU EAST LOCAL GOVERNMENT AREA

The study found that behavioural change affected the use of LLIN by households in EELGA of Enugu State, Nigeria. This may be dependent on lack of belief of the messages being spread in favour of use of LLIN. Apathy to government programmes may be a hinderance to use of LLIN; fear of side-effects might also limit use of LLIN by households; sleeping arrangements inside the home; interference of nets with daily activities in non-bed sites; perceived absence of mosquitoes; and perceived net ineffectiveness of LLIN were investigated as indicators of bevaioural change, and found to have effects.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

6.1 SUMMARY OF FINDINGS

Access to LLIN was signficant in households in EELGA, Enugu State, Nigeria. About 76% of respondents agreed that there was significant access to LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 24% held otherwise.

The use of LLIN was not significant by households in EELGA. Only 21.1% agreed that there was significant use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 78.9% believed otherwise.

Behavioural change affects the use of LLIN by households in EELGA of Enugu State, Nigeria. About 72.8% agreed that habit had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. All 7 behavioural change indicators investigated (apathy to government programmes may be a hinderance to use of LLIN; fear of side-effects might also limit use of LLIN by households; sleeping arrangements inside the home; interference of nets with daily activities in non-bed sites; perceived absence of mosquitoes; and perceived net ineffectiveness of LLIN) were found to have effects.

About 77.7% agreed that apathy to government programmes had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 82.1% agreed that fear of side-effects had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 80.1% agreed that the structure of sleeping arrangement inside the home had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 79.4% agreed

that interference of net on non-bed sites had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 77.7% agreed that apparent absence of mosquitoes had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State. About 76.7% agreed that perceived net ineffectiveness had significant effect on use of LLIN among households in Enugu East Local Gocal Government Area of Enugu State.

6.2 CONCLUSION

Long lasting insectice-treated net (LLIN) coverage or access has improved in the fight against malaria. But, its use is still a far cry. Behaviour change is responsible for this gap, and should become the next issue to tackle in effort to roll malaria back in communities.

6.3 RECOMMENDATION

Efforts at rolling back malaria should now be geared towards behavioural change in households in the communities to enable effective utilization of accessed LLIN. This is the way to begin to realize the second and final target of ñAbuja targetsò of 2000 for 2005, which is yet to be actualized, ten years later.

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APPENDIX

APPENDIX 1: QUESTIONNAIRE

Institute for Development Studies,
University Of Nigeria Enugu Campus
August, 2015

Dear Respondent,

The undersigned, Ekene Emeka-Owoh, is an M.Sc candidate of the above-named Institute carrying out a research titled ñACCESS AND USE OF LONG LASTING INSECTICIDE-TREATED NET AMONG HOUSEHOLDS IN ENUGU EAST LOCAL GOVERNMENT AREA OF ENUGU STATE, NIGERIAò.
The essence of this letter is to request your kind assistance to complete the attached questionnaire. All the information supplied will be treated with utmost confidentiality and will be used only for the purpose of the research.

Thank you.

Yours sincerely,

Ekene Emeka-Owoh (Mrs.)

QUESTIONNAIRE

SECTION A: BIODATA

1. Gender: Male [ ] Female [ ]
2. Marital status: Married [ ], Single [ ], Widowed [ ], Separated [ ]
3. Age: Below 30 yrs [ ], 31-50 yrs [ ], 51-70 yrs [ ], 71-90 yrs [ ], Above 90 yrs [ ]
4. Level of Education: Primary [ ], Junior secondary [ ], Senior secondary [ ],

Tertiary [ ], None [ ].

5. Major Occupation: Civil servant [ ], Artisan [ ], Trader [ ], others specify _____
6. Name of your community in Enugu East Local Development Centre: (a) Mbulujodo [ ],

(b) Mbulu Oweghe [ ], (c) Mbulu Iyiukwu [ ], (d) Emene [ ], Trans Ekulu [ ].

SECTION B

S/No	Items	Strongly agree (4)	Agree (3)	Disagree (2)	Strongly disagree (1)
Access to lon-lasting insecticie treaed net (LLIN) in Enugu East LGA					
1.	There is significant access to LLIN by households.				
Use of LLIN by households in Enugu East LGA					
2.	The use of LLIN is significant in households.				
3.	Habit of sleeping without mosquito nets limits use of LLIN by households.				
Behavioural change indicators investigated					
4.	Apathy to Government programmes limits LLIN use by households.				

5.	Fear of side-effects limits use of LLIN by households.				
6.	Structure of sleeping arrangements inside the home limits use of LLIN among households.				
7.	Nets in non-bed sites interfered with daily activities and limits use of LLIN by households.				
8.	Perceived absence of mosquitoes limits use of LLIN by households.				
9.	Perceived net ineffectiveness limits use of LLIN by households.				

Thank you.