USE OF INSECTICIDE TREATED NETS AMONG HOUSEHOLDS WITH CHILDREN UNDER FIVE YEARS IN AGOTIME-ZIOPE DISTRICT

BY

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(10637188)

THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE.

JULY, 2018
DECLARATION

I, the undersigned, confirm that the work that I have presented as my dissertation is entirely my own work. Reference to, quotation from, and discussion of the work of any other person has been duly acknowledged within the work in accordance with University guidelines for the production of a dissertation. I further declare that this dissertation has not been submitted for any degree programme in this university or other universities elsewhere.

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DEDICATION

“We all have dreams.
But in order to make dreams come into reality,
It takes an awful lot of determination, dedication, self-discipline, and effort”

JESSE OWENS

This thesis is dedicated to MY MOTHER, Mrs Perpetua Afiwo Abiwu, a strong and enthusiastic woman, who have always been a constant source of encouragement and taught me to trust in God – MAWUGA at all things.

God bless you.
ACKNOWLEDGEMENT

This accomplishment was due to many individuals who dedicated time and efforts to help in shaping the goal.

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My special thanks go to the Agotime-Ziope District Directorate for allowing me to conduct this project in the District. I also appreciate the entire District Health officials for their support and most particularly the Community Health Nurses who served as research assistants for the data collection, Perfect (MFP), Jacob (HPO) and Wise Akoto for their diverse support. I recognized with gratitude the contribution of Afegame, Agbagodo, Akpokope, Wudzereke and Ziope communities particularly those who willingly participated in this study.

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As a final note, I am ever grateful to God Almighty, for giving me the strength, knowledge, and wisdom to accomplish my Master's programme and writing this dissertation especially for His spiritual support in the hard times.
ABSTRACT

Background: Malaria remains a major cause of illness and death globally especially in malaria endemic countries. With substantial increase in funding for malaria control programs, countries in Sub Sahara Africa scaled up delivery of insecticide treated bed nets to households, increasing number of households owning ITNs and expectation of reduced malaria. ITN was identified as a verified useful and cost-effective tool for malaria prevention through consistently use by beneficiaries. However, utilization comparatively remains low. The study explored the current use of ITNs, assessed the household perception associated with ITNs and factors that influence households with children under five years to use the nets in the Agotime-Ziope District of Ghana. Methods: A qualitative study was employed adopting five FGD sessions and ten IDIs to collect information from heads or spouse of households drawn from five communities. Data was analysed using QSR NVivo 10 data analysis software according to the framework for conducting thematic analysis and captured themes that emerged from the data. Result: Findings revealed that majority of households have very good knowledge about malaria and its causes; were aware of ITN as the best measure for preventing malaria and also have experienced ITN use. Reasons that motivated users of ITNs included health improvement noting the severity of malaria; economic benefits regarding cost saving weighing the cost of treatments with that of prevention; maintenance of peace and tranquility in the family; contentment; and uptake of ITN use as habit. Non-enthusiastic users of ITNs noted perceived discomfort, ineffectiveness of ITNs to protect them against bites of mosquitoes, perception that mosquitoes are not always available and inability to hang nets because of its shape and limited space at sleeping places. No known cultural taboo or social restriction exist in the communities that prohibition ITN use but gender issues have implications for ITN use. Conclusion: Though ITN use is accepted to prevent malaria, some households remain adamant to adopt its use. Interventions should
intensify sensitization targeted at household heads to recognize the severity of malaria, demystify the unscientific and personal sentiments against ITN use and reinforce the positive sentiments, with community engagement that support designing culturally acceptable messages. Monitoring strategies to visit homes encouraging consistent bed nets use and development of culture of ITN use especially among the young people is critical.
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<tr>
<td>ANC</td>
<td>Antenatal clinic</td>
</tr>
<tr>
<td>CBSV</td>
<td>Community Based Surveillance Volunteer</td>
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<td>CHPS</td>
<td>Community-based Health Planning System</td>
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<td>CWC</td>
<td>Child Welfare clinic</td>
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<td>DHD</td>
<td>District Health Directorate</td>
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<td>DHMIS</td>
<td>District Health Information Management System</td>
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<td>FGDs</td>
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<td>GDHS</td>
<td>Ghana Demographic Health Survey</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GHSERC</td>
<td>Ghana Health Service Ethical Review Committee</td>
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<td>GMIS</td>
<td>Ghana Malaria Indicator Survey</td>
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<td>Ghana Statistical Services</td>
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<td>IDIs</td>
<td>In-Depth Interviews</td>
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<td>ITNs</td>
<td>Insecticide-Treated Mosquito Nets</td>
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<td>JHS/SHS</td>
<td>Junior High School/Senior High School</td>
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<td>LLINs</td>
<td>Long Lasting Insecticides Nets</td>
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<tr>
<td>MGD</td>
<td>Millennium Development Goal</td>
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<td>NGOs</td>
<td>Non-Governmental Organizations</td>
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<td>NMCP</td>
<td>National Malaria Control Program</td>
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<td>OPD</td>
<td>Out Patient Department</td>
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<td>PHM</td>
<td>Persuasive Health Message</td>
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<td>PMI</td>
<td>President’s Malaria Initiative</td>
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<td>RBM</td>
<td>Roll Back Malaria</td>
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<tr>
<td>SBCC</td>
<td>Social and Behaviour Change Communication</td>
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<td>SSA</td>
<td>Sub-Saharan Africa</td>
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UC - Universal Coverage
UNICEF - United Nations International Children Emergency Fund
WHO - World Health Organization
CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Malaria remains one of the most important parasitic infections that put severe burden on humans. It is also a main cause of health problems in most parts of the world. Approximately, 40% of the world’s population, primarily those living in the world’s poorest countries, is at risk of malaria, resulting in about 250 million clinical cases and more than one million deaths annually (World Malaria Report, 2008). With reference to the 2015 World Health Organization (WHO) fact sheet, 214 million cases of malaria occurred globally leading to 438,000 deaths. The Sub-Saharan African region where 74% of its population resides, accounts for 90% of these deaths (Hollyman, 2015). Malaria therefore contributes significantly to poor health in many African communities. In the Africa region, young children under five years and pregnant women form the groups that are perceived as vulnerable to the effects of malaria.

Malaria has become more devastating as a result of weak economies of Sub-Saharan African countries where favourable conditions that support the breeding of the malaria causing mosquito persist. Insufficient commitment of governments and communities to prevent the disease makes the situation worse (Okech et al., 2008). In Ghana, over a third of all outpatient cases noted each year suffer from malaria. It is shown that malaria prevalence among children under five years of age is about 21% (Ghana Statistical Service, 2014).

Malaria does not only affect the health of people but also has significant economic impact. A study conducted by Gallup & Sachs (2013) estimated the global cost of malaria at US$ 12 billion yearly. In Africa, countries expend above 1% of their Gross Domestic Product (GDP) to deal with the disease yearly. According to WHO, malaria contributes to loss of economic
growth of 1.3% annually. It is also estimated that households spend US$ 6-7 per an episode of malaria (WHO Global Malaria Programme, 2010). In Ghana, it has been identified that in 2014 alone, about US$6.58 million was lost by Ghanaian enterprises due to malaria infection with 90% directly used on treatment (Nonvignon et al., 2016).

Malaria is therefore a great threat to the survival of a nation; hence the need to establish and implement successful control measures to reduce the effect of malaria on human health and national economy cannot be overemphasised. Globally, policies and programmes have been developed as part of actions geared towards the reduction of malaria burden and its complications. One of such pragmatic efforts is the establishment by the World Health Organization in 1998 of the Roll Back Malaria partnership of which Ghana has since been an active member.

It is worth noting that emerging reports from the malaria community however highlight a decline in the burden of malaria by the beginning of the millennium. Since the year 2000, deaths resulting from malaria have declined by 66%, transforming into saving a little over six million lives, with the majority (57.9%) of them being children (Hollyman, 2015). Various countries have implemented integrated vector management strategies that are relevant to reducing the malaria burden across the globe. One of the powerful tools recommended by the WHO in combating malaria is the insecticide-treated mosquito net (ITN) (WHO, 2008, 2010). The use of ITNs has proven to be effective and scaling up its distribution has therefore become an integral part of the fight against malaria. It is likewise the main emphasis of the Millennium Development Goals (MDGs), the Roll Back Malaria (RBM) and President’s Malaria Initiative (WHO, 2013).
Between 2000 and 2015, more than one billion ITNs were distributed globally to households primarily in rural malaria endemic countries including Ghana (WHO Global Malaria Programme, 2010). As a result of this effort, almost half of all the people at risk of getting malaria in the Sub-Saharan region had access to an insecticide-treated net, a marked increase from just 3% in 2004 (World Health Organization Global Malaria Programme, 2014).

In Ghana, more than 35 million long lasting insecticides nets (LLINs) have been distributed between 1998 and 2016, not only to those perceived as vulnerable but to the general population adopting the universal coverage strategy (Gakpey, Baffoe-Wilmot, Malm, Dadzie, & Bart-Plange, 2016).

Despite the increased number of ITNs distributed among households, this does not correspond with the rate of usage. According to other studies, use of ITNs remains well below international targets and in Africa generally, ITNs use remains relatively low with approximately 3% of children sleeping under ITNs (Toé, Jones, N’Fale, Ismail, Dabiré, Ranson, 2014).

One of the African countries where ITNs use is consistently low is Ghana. The Ghana Statistical Service, (2014) indicated that, out of the 68% of households that possess at least one ITN, below half (47%) of children under age five and pregnant women (43%) slept under an ITN the night before the survey. Other studies conducted in Ghana also showed that many households were not using their ITNs because of poverty, inconvenience, and the belief that the strategy is not effectively controlling malaria (Adeyeri, 2011; Azabre, Teye, & Yaro, 2014). This proved that high ITNs coverage alone is insufficient to facilitate reduction of malaria disease.
With Ghana’s goal of achieving 80% coverage of ITNs ownership and 75% usage by 2030 (National Malaria Control Programme, 2015), it is prudent to monitor the use of ITNs by households. This would ensure sustainability of the progress made and stimulate high uptake of ITNs use to achieve the goal.

Based on this, a study in Agotime-Ziope district that explored malaria transmission knowledge among households with children under five years, their perception regarding malaria prevention and ITN was pertinent. Additionally, the underlying factors that influence ITNs use in the study area were examined.

1.2 Problem Statement

Slightly above three quarters of malaria deaths worldwide happened in under-five children living in malarious countries in Sub-Saharan Africa, taking the life of a child every two minutes (WHO Report, 2015).

Many countries in Sub Sahara Africa are promptly increasing insecticide treated net coverage in the bid to reduce the impact of malaria. The use of these ITNs is critical in malaria control in line with the assertion that ITNs can reduce the occurrence of malaria among children under 5 years of age by approximately 50% and all-cause mortality by 17% (WHO, 2013). Regardless of these indications, validating the usefulness of insecticide treated nets to decrease malaria-related morbidity and mortality, there have been many difficulties to ITNs distribution, acceptance, consistent and appropriate use (Okiro et al., 2007).

Recent data by the Ghana Statistical Service, (2016) in the Ghana Malaria Indicator Survey (GMIS) indicates that approximately 73% of households in Ghana own at least one LLIN, with 52% having one LLIN for every two persons as compared to the 31% in 2008. The report further indicates that since 2008, there has been an increase in the ownership of any
type of net from 45% to 75% and ITNs especially from 42% to 68%. However, the increase in ownership did not correspond with its use as revealed by the same report. Accordingly, the report showed that only 48% of households who own ITNs slept under it the night before the study. It further revealed that household structure, attitude of users and perception of ITN effectiveness are becoming obstacles to maximum use of ITNs.

Many other studies conducted in Ghana to assess ITNs coverage, reasons for non-use of ITNs among pregnant women and the general population equally revealed that large households who reside in fewer rooms in compound houses with more than five persons in a room are less likely to use ITNs (Dako-Gyekye & Kofie, 2015; Manu et al., 2017; Nyavor et al., 2017). Outcome of studies conducted elsewhere highlighted large family size, wealth index of the household, educational level of household head as contributing factors to non-use of ITNs. (Ruyange et al., 2016) This buttressed the points made by Githinji, Herbst, Kistemann, & Noor, (2010) that possession and appropriate use of ITNs do not spontaneously go hand-in-hand.

These socio-cultural factors that have been noted as obstacles for effective use of ITNs confirmed the assertion by Dako-Gyekye et al., (2015) that occurrence of malaria cannot be explained only from the biomedical point of view, other factors such as religious beliefs, cultural and traditional practices and economic conditions prevailing in households with children under five years should be taken into consideration.

Agotime-Ziope District is one of the newly created rural districts in the Volta Region. Over the years, there has been a remarkable improvement in the health status of the people in the district. Diseases such as polio and guinea worm have been eradicated. However, malaria remains the top most cause of ill health in the Agotime-Ziope District accounting for over 33% - 45% of outpatient department attendance over the years. The District Health
Information System (DHMIS -2) records show that in 2015, malaria accounted for 39% of outpatient visits representing 9,953 cases with 38.5% (3833) being children under five years. In 2016, the malaria cases increased to 11,517 representing 45% of all total OPD cases and children under five years accounted for 35% (3,994) of the cases. However, the total malaria cases reduced to 5,293 representing 33% in 2017 with 1,794 being children under five years indicating 34% (Agotime-Ziope District Health Directorate, 2016). This especially has devastating effects on children under five years including anaemia, poor developmental outcomes, behavioural problems, short stature and neurological defects (Okiro et al., 2007).

According to unpublished District Health Directorate (DHD) 2017 performance review report, the current situation can be attributed to the numerous mosquito-breeding swamps, hundreds of wells and water bodies found in the districts (Agotime-Ziope District Health Directorate, 2017).

Other causes of ill health prevailing in the district include diarrhoeal diseases, upper respiratory tract infection, hypertension, skin diseases and Rheumatism and joint pains.

Leadership of the Agotime-Ziope District consider control of malaria a very high priority. Since 2015, the DHMT had support from the Global Fund and USAID through National Malaria Control Program (NMCP) to carry out various activities. The DHMT has promoted the acceptance, use and care of ITNs as one of the essential components of malaria prevention and control in the district. Free ITNs are distributed through a wide range of different strategies including public health system targeting pregnant women attending Ante Natal Clinic (ANC) for the first time, young children attending post-natal clinic and point mass distribution campaigns targeting all households through community-based surveillance volunteers (CBSVs). Records available in the district show that more than 28,600 ITNs have

Primary schools also serve as another channel through which ITNs are distributed to households. In 2014 and 2017, Primary schools in the Agotime-Ziope District benefitted from free LLINs distribution. Specifically, 2,108 Primary 2 and Primary 6 pupils received ITNs in 2017 (National Malaria Control Programme, 2017). As per these records, it is recognised that a lot of free bed nets have been distributed to households within the district, in an attempt to prevent community members especially children under five years from mosquito bites.

Health officials conduct sensitization, demonstration sessions on proper hanging and use of ITNs and other Social and behaviour change communication (SBCC) activities in the communities to create awareness and motivate consistent use of ITNs.

Despites all these efforts of delivering large quantity of ITNs to community members and education on its use, malaria remains the most common and life-threatening disease in the district. Information gathered through observations during home visits by Community Health Nurses (CHNs) reveals that community members are not patronising the use of the ITNs.

In the study setting, inadequate information is available to ascertain the factors contributing to the low patronage of use of the bed nets by household members. The various empirical investigations carried out in other places though make available information on possible contributing factors for ITNs use, only few focused on categorising factors linked to the use particularly in the rural communities which have different socio-economic features as compared with urban communities. There is equally limited information on community-based
actual use of bed nets with reasons specifically related to targeted areas within the Ghanaian context.

This study therefore serves as medium of exploring the factors that influence the use of ITNs by households with children under five years in the Agotime-Ziope District.
1.3 Justification

The World Health Organization’s (WHO’s) Roll Back Malaria Partnership have certain goals related to malaria. These included bringing down malaria cases to 75 % in the world and to also reduce malaria deaths to almost zero by adopting universal coverage through effective prevention and treatment interventions by 2015. One preventive intervention is the use of Insecticide-Treated Nets (ITNs), particularly Long-Lasting Insecticidal Nets, which have been shown to be cost-effective in cutting down malaria episodes among children below the age of five years by around 50% and all-cause mortality by 17 %. Universal coverage with ITNs is defined as use by more than 80% of individuals in populations at risk with every two persons assigned one ITN. WHO and its partners continue to provide fund to countries to ensure that reducing malaria related morbidity and mortality are achieved. In 2013, international and domestic funding for malaria control and elimination amounted to US$ 2.7 billion (World Health Organization Global Malaria Programme, 2014).

In Ghana, government agencies and non-governmental organizations have gone ahead to distribute ITNs in large quantities through a wide range of strategies that aimed at delivering the nets which would address the coverage problems in most parts of the country. Currently, there are also efforts to increase and sustain high ITNs utilization through social and behaviour change communication channels; yet ITNs usage remains low. With the present goal of the GHS/NMCP to provide and encourage consistent use of ITNs not only by the vulnerable groups but the rest of the community, the study provides a better insight of community-led factors that influence ITNs utilization by households especially those households with children less than five years.
This level of evidence would equally form the foundation for designing tailor-made behaviour change communication strategies with local content messages for inculcating net use culture among households within the Agotime-Ziope District.

This study further provides information for monitoring ITNs ownership and use in rural areas as the study was conducted in one of the rural districts with its peculiar socio-cultural characteristics. Additionally, few studies highlighted the female influence on the use of ITNs. As such, the study ensured total engagement of both female and male household heads in order to understand the main motivation of female and male household heads for their use of ITNs.

Interests of influencers of ITNs ownership and use such as development partners and Non-governmental organizations (NGOs) were not overlooked, recognizing their continuous support will facilitate increased ownership and use of ITNs.

Recognising the public health benefits this study would provide for long-term malaria programming, the level of ITN use and most particularly, factors influencing use of ITNs owned by households with children under five years in the Agotime-Ziope district were looked at critically to determine strategies that could be adopted to persuade household heads and care givers to appropriately use ITNs.
1.4 Theoretical framework

This study anchors on the Persuasive Health Message (PHM) framework which outlines how to develop effective and persuasive campaigns by combining, into a single framework, parts of successful theories that attempt to explain human behaviour as developed by Witte, (1995). The PHM framework combines elements from three prominent persuasion theories, Theory of Reasoned Action (Fishbein & Ajzen, 1975), Elaboration Likelihood Model (Petty & Cacioppo, 1986) and Protection Motivation Theory (Rogers, 1983) to provides an integrated approach to producing messages and campaigns that are suitable to be used in various cultures within all geographical zones. In addition, the PHM framework provides a step-by-step approach showing the process of designing effective and persuasive health messages and communication campaigns (Witte, 1995).

The PHM has been adapted in various studies to develop messages primarily on fear appeals to addressing serious health topics directed at changing health behaviours (Carciooppolo et al., 2013; Duong & Bradshaw, 2013). This model has recently been shown to have value for other types of appeals (Lewis, Watson, & White, 2013). The PHM facilitates development of messages that create a perceived sense of threat in target audience while increasing their perceived ability to take action to protect themselves against the threat (Witte, 1995). The PHM framework further specifies that there are constant and transient factors that should be taken into consideration when designing an effective persuasive health message. As a way of illustration, a persuasive health message need to encompass a threat and efficacy message, the cues such as the channels to adopt in disseminating the message, and targeting a specific audience (e.g., households with children under five years). The transient factors of a persuasive message are those that specify modification of behaviour of different populations, health concerns, and the aims of the message (Witte, 1995).
In this study, the PHM framework was used to explore the factors that influence ITNs use among households with little children less than five years. The study identified the cues to promoting net use at the household level and described knowledge, and perceptions surrounding bed net use in households with children under five years in the Agotime-Ziope District.

The theoretical framework as shown in Figure 1 is an adaptation of the PHM as developed by Witty (1995) and applied to motivating households to use ITNs for their children under five years. The framework postulates that for people to adhere to a recommended response that is the consistent and appropriate use of ITNs, they must feel threatened by their health situation, believe that a change in behaviour will have an overall favourable outcome despite the costs and belief that they are competent to change and take actions. In this model, constant factors are likely to affect the transient factors of ITNs use, perceived benefits of ITNs use, and efficacy of protecting children against mosquito bites. These two components affect the likelihood that households with children less than five years will take action to use ITNs to protect their children against mosquito bites.
Utilization of ITNs is regarded as key malaria prevention and control strategy. Large number of ITNs has been distributed to households. However, several studies showed large gap in usage. Efforts to encourage households that own ITNs to consistently use them require effective communication interventions about the efficacy of the ITNs in malaria prevention and the susceptibility of malaria based on non-use of ITNs adopting relevant medium of education with targeted audiences. The PHM framework adopted for this study stipulated that if a person recognises a condition that poses a threat to one’s health, and is exposed to effective and persuasive communication messages on efficacy of a tool for protection against that threat, audience are able to take actions to adopt that tool. Adopting the PHM framework therefore facilitate the designing of tailor-made communication strategies that move people to
change their minds, perceptions and attitudes towards the acceptance and utilization of ITNs as effective tool for malaria prevention.

1.5 Research questions

1. What is the household heads’ knowledge about malaria transmission?
2. What is the perception of household heads on malaria prevention in the district?
3. What factors influence the use of ITNs in the district?

1.6 General Objective

To explore the factors that influence ITN use among households with children under five years in the Agotime-Ziope District in the Volta Region of Ghana.

1.6.1 Specific Objectives

1. To assess the knowledge of household heads about malaria transmission in the Agotime-Ziope District.
2. To examine the perception of the head of households on malaria prevention in the Agotime-Ziope District.
3. To explore those factors that influence the use of ITNs in the Agotime-Ziope District.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
In an attempt to strengthen arguments and prove the validity of conclusions drawn from the research work, the study made use of available literature on malaria, its prevention and ITNs. This chapter is dedicated to the literature review that provides brief description of malaria epidemiology, malaria prevention and household knowledge and utilization of ITNs. Furthermore, information is provided on the factors associated with ITN use.

2.2 Malaria Epidemiology
According to historians, malaria has been in existence amidst humans for a long period. The Chinese referred to the disease as the most dangerous fevers due to its severity. Those it affected used protective measures dating back to 484-425 BC. According to King Herodotus, people use beautifully designed apparels that are beyond the range of mosquitoes because of its ability to ward off the mosquitoes in part of Egypt marshy surrounding areas, where mosquitoes were very common to protect themselves (Diseases, 2010).

Currently, malaria lingers on as one devastating vector-borne disease. *Plasmodium* parasites are noted to be transmitted through the bite of infected female Anopheles mosquitoes to humans. Generally, five parasite species are responsible for causing malaria in humans. *P. falciparum* is the most prevalent malaria parasite in the African region together with *P. vivax* creating the ultimate threat including deaths worldwide.
Every individual all over the world especially in endemic countries are at risk of being infected with malaria parasites. However, pregnant women, especially in their first trimester, children under five years, migrants with less immunity and people living with HIV/AIDS, are equally regarded as vulnerable. Malaria in pregnant women poses high risk of abortion, miscarriages and stillbirth. This also results in maternal mortality with its resultant impact on child survival (WHO Report, 2015).

Globally, malaria threatened the life of about 3.3 billion people in the year 2014 and in 2015 about 3.2 billion people that form the majority of the world's population were at risk of malaria. There were approximately 214 million malaria cases and 438,000 malaria deaths documented in 2015. The use of measures that support prevention and control of the condition resulted in a 60% reduction in malaria mortality rates globally since 2000 (WHO Report, 2015).

Countries in the Sub-Saharan Africa are always experiencing high effects of malaria as compared to other parts of the world. In 2010, about 90% of all malaria deaths that occurred worldwide were recorded in Africa mostly among children with an estimated 655,000 deaths. Furthermore in 2015, 89% of malaria cases and 91% of malaria deaths happened in those countries (WHO Report, 2015). The death toll in young children occurs through acute infection, repeated malaria infections and low birth weight. On the other hand, large numbers of people who are affected with malaria do survive (WHO, 2013). However, Samba, (1997) indicated that those individuals who suffered from malaria live to experience lasting consequences of the infection that retards the development of the brain of the patient becoming epileptic.
This situation of high illness and death associated with malaria was attributed to several factors such as poor community related factors, unacceptable level of ITNs utilisation, limited availability and delivery of health services and other individual factors. The World Health Organization proposed that these main factors play significant role in the persistent condition of malaria worldwide (WHO Report, 2015; World Health Organization Global Malaria Programme, 2014).

Malaria is preventable, and several control and prevention measures are intensely reducing its burden in many places. In the African continent, the situation has decreased by 33% over the period of 2000 and 2010 (WHO, 2013). In 2014, a projected 214 million long-lasting insecticidal nets (LLINs) were supplied to countries with high malaria cases in Africa bringing the total of 427 million treated mosquito nets delivered to Africa since 2012. Also, by the end of 2013, 124 million people were protected from malaria through indoor residual spraying around the world (World Health Organization Global Malaria Programme, 2014).

Ghana is one of the countries where malaria is endemic and perennial in all parts of the country with seasonal variations manifesting more in the north (National Malaria Control Programme; PMI, 2015). This assertion was supported by President’s Malaria Initiative Operational Plan for 2015 indicating that Ghanaian experience malaria throughout the year. The country experiences two main malaria transmission forms, prevailing in the northern and southern parts of the country. More malaria cases occur between July and November in the northern portion of the country whiles the southern part experiences larger peak from October to November. Plasmodium falciparum accounts for 85-90% of all infections. *Plasmodium malariae* (<10%) is also found and more rarely *P. ovale* (0.15%).
The major vectors are Anopheles gambiae species complex and *Anopheles funestus*. These species generally bite late in the night, will rest both indoors and outdoors, and are most common in the rural and peri-urban areas. However in the northern savannah, the mosquitoes bite outdoor (National Malaria Control Programme; PMI, 2015). In general terms, Ghana can be divided into three malaria epidemiologic zones though not evenly: the northern savannah, the tropical rainforest, and the coastal savannah/mangrove swamps. This has a significant influence on malaria transmission (Ghana Statistical Service, 2014).

### 2.3 Malaria Prevention

ITNs is the most economical, efficient and useful tool that have significantly reduced the threat of malaria on children in relation to illness and death as well as providing communal benefits to the family (Kleinschmidt et al., 2009). As a malaria prevention tool, insecticide impregnated bed nets have become an integral part of the global strategy. In the past, mosquito nets of any kind acted as a physical barrier between the vector mosquito and the human beings sleeping under them. For a while, pyrethroid chemicals are used to treat bed nets thus adding a chemical protection that has a repelling effect on the mosquitoes or kills any mosquito upon contact. As such the chemical component increases the protective efficacy of the bed net resulting in the reduction of the vector population. Evidence indicates that ITN’s protective effect occurs when greater portion of all individuals in an endemic community steadily sleep under the treated mosquito nets. Consequently, this results in reducing the lifespan of mosquitoes and malaria transmission within a community (WHO Report, 2015).

Presently, all bed nets in circulation are Long Lasting Insecticidal Nets (LLINs). An LLIN is a net that already has the chemicals implanted into the fibre during the manufacturing process
in the factory and demand no further treatment. It has a useful life of up to three years before it becomes less useful (WHO Global Malaria Programme, 2010).

ITN/LLINs have been noted to forestall around 50% of malaria cases making its protective efficacy greater than that of untreated nets. The international community targeted the year 2000 as the time when 80% of vulnerable groups noted as pregnant women and children under five years would be sleeping under insecticide-treated nets. This target was revised with the coming of US President’s Malaria Initiative to 85 per cent in the most 15 highly endemic countries (USAID, 2015). Furthermore, in 2010 malaria community accepted the pushing of Universal Coverage. This concept was given different interpretation by individual endemic country. But the most accepted interpretation is the provision of one ITN for two people expanding the scope of ITN coverage from vulnerable groups to all population residing in endemic countries (WHO Global Malaria Programme, 2010).

Ghana has also adopted this concept of Universal Coverage and has been using different channels to make ITNs available mainly to children under five and pregnant women since 1998. Maternal and Child Health promotion campaigns, a voucher scheme and highly subsidized and commercial outlets sales were adopted. In 2010, to achieve the universal coverage, a Door to Door distribution and Hang up of ITNs campaign was organized. In this campaign, treated bed nets were actually hanged on sleeping places of households with no payment made by household heads (Ghana Health Service, 2010). This pushed ownership of ITN to 98% nationwide through the distribution of an estimated 21.4 million ITNs to households (Gakpey et al., 2016).
To sustain this gain of high rate of ownership, ITNs are routinely distributed free through the continuous distribution strategy. This involves multiple channels including promotion of ITN through Antenatal clinic (ANC), Child Welfare clinic (CWC) and primary schools were decided upon. The targets for these channels are pregnant women attending ANC for the first time for a particular pregnancy hereby referred to as registrants; children between 18-24 months receiving the second dose of measles for CWC; and primary two and six pupils for the Primary school strategy (Ministry of Health/ Ghana Health Service, 2013).

Years ago, households use bed nets to avoid the discomfort created by bites of nuisance mosquitoes but not necessarily to prevent malaria infection thus showing minimum ownership and usage coverage (Zimicki, 1996). This assertion was confirmed by another study which found out that the early household high desire to use ITNs (97%) of bed net use has dropped to 50% after two years, and further reduced to 20% in the hot dry season. Those were periods when most mosquito nets were sold in the markets, shops or health facilities (Binka & Adongo, 1997).

As time went on more households embraced the use of ITNs as both physical protectors and chemical protective measure against mosquito bites. For instance, in 2008, Ghana Demographic and Health Survey found one third of households have at least one insecticide-treated bed net compared with only 3% of households in 2003. Ownership ranges from 20% in the Greater Accra region to 47% in the Upper East Region. Additionally, 11% of households have more than one ITN. Ownership is highest among the poorest households (Ghana Statistical Service, 2008). Recent data put out by Ghana Malaria Indicator Survey (GMIS) indicates that overall approximately 73% of households in Ghana own at least one ITN, with 52% having one ITN for every two persons.
The survey also found out that 27% of households do not have any ITNs. This data shows an increase in household ownership of at least one ITN from 31% in 2008 to 73% in 2016 (Ghana Statistical Service, 2016). In the Volta region including Agotime-Ziope District, 76% of households own an ITN. In relation to using the ITN, the survey shows only 46% of households in the Volta region and 42% households nationwide slept under a treated net the night before the survey.

This shows a gap between access to and use of ITN by the general population. Significantly, 62% of children under five slept under ITNs the night of the survey though they are prone to malaria due to their lack of immunity. This reveals that though ITN coverage is high, utilization is still below the WHO recommended threshold of 85%. (Ghana Statistical Service, 2016)

### 2.4 Household Knowledge and Utilization of ITN

Several studies conducted in Ghana and elsewhere noted that central to effective utilization of ITNs is the knowledge level of community members about the cause and transmission of malaria (Oresanya, Hoshen, & Sofola, 2008; Thawani, Kulkarni, & Sohani, 2009). WHO estimated that since the year 2000, over one billion ITNs have been distributed in Africa and by 2014, 56% of households in Sub-Saharan Africa own at least one ITN. Information from the global malaria community specified more (68%) children less than five are sleeping under an ITN in Africa. An array of studies carried out to assess the level of usage of ITN revealed an improvement in many countries (WHO Report, 2015).

A study carried out by Musa, Salaudeen, & Jimoh, (2009) in Nigeria assessed pregnant women’s awareness, accessibility and use of ITN.
Findings indicated about one-third of the 455 study population interviewed (37%) were aware of ITN as a measure for preventing malaria. However, 337 representing 73% have never used ITN before. Another study conducted in the Coastal plain of Chiapias, Mexico by revealed that all respondents (100%) had heard about malaria and ITNs. Most of the respondents (98.1%) have used varied methods to prevent mosquito bites, out of which 94.3% used insecticide treated bed nets (Mora-Ruiz et al., 2014).

These findings are not different from what was found in the Zambia. Over 50% of pregnant women in a cross-sectional study appropriately stated that malaria is spread to humans by mosquitoes infested with malaria parasites. Others (23.4%) attributed malaria to being drenched with water and long stay under hot sun in addition to the mosquito bite. In response to ways of preventing malaria, the same study found out that 60.4% adopt a combination of sleeping under bed nets, pruning bushes around homes and spraying with insecticides. Only few (18%) stated using treated bed nets alone as a way of preventing mosquito bite. Accordingly, respondents have misconceptions about malaria transmission, assuming that the disease can be transmitted by other means other than mosquito bites; hence the need for adoption of multiple preventive measures (Zingani, Mtonga, Chichonyi Kalunga, Mukosha, 2017).

Rwanda after distributing about 4.1 million ITNs in 2010 saw 75% of children less than five years sleeping under ITNs. This specified an increase of 25% as compared with usage within the period of 2007-2008. Research by into factors associated with the use of ITNs showed an upward utilization of from 58.6% in 2010 to 68.4% in 2014. Use of households with children under five years also shifted to 60% in 2014 from 50% in 2010 (Moon et al., 2016).
Although the study found an improvement in adopting the use of ITNs, it is still below the universal coverage of 80% as recommended by the WHO.

According to research carried out in three communities in Ethiopia, the overall ownership of LLINs within a household in the study area was 97.6%. Majority of households (53.2%) owned a single bed net with more than 40% of the respondents owned two or more nets per household (Animut et al., 2008). The Ethiopian national malaria indicator survey of 2007 indicated that about 71% of the rural community and 80.5% of the urban community have heard about malaria. However, only 30.1% of the rural and 59.7% of urban community knew that mosquito bite can transmit malaria. This therefore influenced their level of ITN usage because the survey found 52.7% of pregnant women and 51.8% of children slept under ITN the previous day of the interview (Zewdie Aderaw, 2013).

In Ghana, several empirical investigations show that community members’ knowledge about the cause transmission and prevention of malaria has increased in most districts. One of such studies was conducted by Nyavor et al., (2017) in Hohoe municipality where all mothers/caregivers respondents had heard about malaria and insecticide treated net. A little more than half (52.9%) got their information from Reproductive and Child Health clinic whereas 33.6% head about it from the antenatal clinic with 8.6% from community meetings. The mass media such as radio and television were mentioned by 4.9% of respondents as their source of information and only 1.3% of mothers/caregivers claimed they have never heard about ITNs. This high level of knowledge about malaria was displayed by correctly pointing out the signs and symptoms of malaria. About 80% identified hot body or fever as a major sign whiles 13.8% listed diarrhoea, vomiting, bitterness in the mouth. However, about 6.2% of the mothers/caregivers were indifferent on their knowledge of malaria.
The researchers further found out that 82.2% attributed malaria to mosquito bites whereas playing under the sun, dirty environment and drinking dirty water were mentioned as causes of malaria. Greater number of mother/caregivers signifying 90% identified children under five years as the most population at risk of malaria infection with the rest pointing out pregnant women as equally at risk (Nyavor et al., 2017).

Manu et al., (2017) also conducted a study at Kintampo on utilization of ITN among pregnant women in the middle belt of Ghana and indicated high knowledge level of respondents about insecticide-treated nets (ITNs) and its importance in malaria prevention. They perceived sleeping under ITNs as very beneficial especially to a pregnant woman and her unborn child as it provides sound sleep devoid of buzzing noise by mosquitoes.

From the discussions in section 2.3, there is proof of high knowledge of malaria transmission and the ITN being a useful tool in the fight against malaria. However, acceptability and consistent use remains a challenge. This requires scaling up of interpersonal communication strategies taking into consideration the issues specific to the locality.

2.5 Factors regarding use of ITNs

2.5.1 Attitude and practices regarding malaria and the use of ITNs

Insecticide treated nets (ITNs) are vector control tools that serve as one of the competent malaria prevention interventions. ITNs reduce overall spread of malaria and protect everybody where ever they are located. Treated mosquito nets have been accepted as the most preventive tools in the fight against malaria particularly in Sub-Saharan Africa. For ITN to be effective, willingness of households to appropriately use it is critical (Roll Back Malaria, WHO, & UNICEF, 2005).
Studies have assessed how community attitude and beliefs about malaria affect utilization. The issue about the preference for a particular colour of net by a community has raised concern for the low utilization of ITNs. While white nets are sometimes preferred in urban environments in Africa; green nets are preferred in Islamic countries whereas in Asia and the South Pacific people like a variety of colours and multi-coloured nets (Adogu & Ijemba, 2013). Therefore, supposing there is varied colour to communities which are colour biased, the usage of ITNs turns to receive low attention.

Ghanaians were found to have the perception about nets being too hot to sleep under and findings from the study suggested that stakeholders should address problems of ventilation and heat by increasing mesh size and using durable materials (Galvin, Petford, Ajose, & Davies, 2011). The effectiveness of ITNs in shielding young people under five years against mosquito bites cannot be overlooked. Similarly, there are a lot of misconstrued attitudes and practices about ITNs that needs prompt attention. No known study has assessed the attitude and practices that influence ITNs use for children less than five years in the Agotime-Ziope District; the present study therefore seeks to fill this gap.

2.5.2 Socio-cultural factors associated with ITN use

Regardless of several evidences establishing that wider use of ITNs decreases malaria related mobility and mortality, many obstacles to effective ITN approval and appropriate use have been identified by some studies (Aderibigbe et al., 2015; Feachem et al., 2008). Community related factors including socio-cultural considerations of the use of ITNs have been shown to lead to low utilization of ITNs (Feachem et al., 2008).
A growing body of evidence link adoption of malaria control measures to various socio-economic and cultural factors. In assessing obstacles inhibiting one’s decision to adopt the utilization of ITN, an analysis of 22 studies presented heat related discomfort, low perceived mosquito density, availability of nuisance mosquitos as well as educational level of mothers as community-level factors (Pulford, Hetzel, Bryant, Siba, & Mueller, 2011) This has been supported by a study in Swaziland who pointed out the influence of community on effective implementation of malaria control programs (Hlongwana, Mabaso, Kunene, Govender, & Maharaj, 2009). Other factors such as inability to hang a mosquito net and the structure of sleeping places were further noted as technical obstacles influencing ITN use (Baume & Franca-Koh, 2011; Pulford et al., 2011).

In similar studies, perceptions of net ineffectiveness, insufficient availability of nets at the household level and sleeping arrangements still reduces consistent net use (Eisele, Keating, Littrell, Larsen, & Macintyre, 2009). Also in Sierra Leone, households keep ITNs purposely for visitors and relatives living outside the locality as found out during as assessment of ITN use (Gerstl et al., 2010). Some other studies found characteristics of the household heads such as the age, knowledge of malaria and educational level of household head have great influence on the prevalence of malaria in Zambia (Zingani, Mtonga, Chichonyi Kalunga, Mukosha, 2017). The widespread non-use of ITNs and other malaria control measures turn to have negative implications for the individuals and community as well as the nation (Tobin-West & Kanu, 2016).

Manu et al., (2017) also found out that households who do not use ITNs put forward reasons such as smell of the net, missed opportunity of getting free nets during mass distribution campaign, non-availability of ITNs at the health facilities when expecting one during ANC
visits and inability to purchase a bed net from the commercial outlet due to limited resources especially money.

Comparable study in urban slums in Ghana portrays the probability of many factors influencing adherence of households to malaria prevention and control measures. The factors range from economic conditions of households, type of residential apartment and education of mothers. Specifically, the study noted that households with children under five years who live in slum areas may find it very difficult to consistently use ITNs since their environments are filed with rampant stagnant water bodies, poor drainage system favour high breeding of the malaria carrying vector and hence be overwhelm with large population of mosquitoes. The same study revealed a large family size and overcrowding as high risk factors that hinders consistent use of insecticide treated bed nets since such families may generally be poor, residing in poorly constructed dwelling places (Dako-Gyeke et al., 2015). These findings are not different from those identified in South Western Ethiopia (Alemu, Tsegaye, Golassa, & Abebe, 2011; Bashar et al., 2012).

From the foregone analysis it is clear that some malaria control interventions that have worked within a geographical area may not create the same desired results in other areas. This may come about as a result of diverse socio-cultural factors which require further investigation.

2.7 Summary and conclusion

The literature reviewed shows that the need to eliminate malaria has attracted much attention from researchers, international organizations, and local governments. In addition, a large body of literature available shows that treated bed nets offer some degree of protection.
However, acceptance and utilization of the ITN by households continue to wane. They are not used for several reasons including misconceptions on its viability, attitude and practices of intended beneficiaries and the tendency of ITNs being used for purposes other than protection against mosquito bites.

The significance of this study to the work of the National Malaria Control Program of the Ghana Health Service and its partners particularly community level NGOs, lies in the fact that it provided relevant information on community factors influencing ownership and use of ITNs in families with children under the age of five years. The information provided by this study would further offer a good level of guidance in modifying behaviour change messages directed at families towards stimulating greater demand for ITNs and as well as inculcate in them higher acceptance, use and care for ITNs.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

This study has the purpose of exploring factors that influence households with children under five years to use ITNs as a measure to reduce the high prevalence of malaria among community members in the Agotime – Ziope District.

This chapter focuses on the methodology by which this study was conducted. It includes the description of the study design, the study area, the target population and the methods of data collection. Data management and analysis, ethical considerations and the limitations associated with the study are also outlined in this chapter.

3.2 Study Design

The current study adopted a qualitative approach to examining ITN use by households with children under five years and used focus group discussions (FGDs) and in-depth interviews (IDIs) for data collection. These two techniques provided a comprehensive understanding of the factors that influence level of ITN use, knowledge and perception of household heads on malaria prevention.

The qualitative approaches facilitate the analysis of data from a population or its representative at a specific point in time. It presents a snapshot of the characteristics of a situation in a population. These approaches further help in unfolding a social phenomenon within its natural setting for a better understanding. It further leads to discovering the causes of events and people’s preferences including the use of ITNs in preventing malaria at a particular time.
The chosen study design therefore was deemed the most appropriate as it permitted data to be collected at the same time from people with similar characteristics.

3.3 Study Area

The study was conducted in the Agotence-Ziope District situated in the South-Eastern part of Ghana. The district was established in 2000 as one of the 25 Districts in the Volta Region with Kpetoe as its capital. Agotence-Ziope District occupies a total land area of about 315 square km with an estimated population of 27,731 and a growth rate of 1.7% according to the 2010 census conducted by the Ghana Statistical Services (GSS). Present estimates put the population of the district at 33,176 with the male population accounting for 48% and the females at 52% (Ghana Statistical Service, 2010, 2014).

The population of the district depicts a youthful structure with 37.6% below 15 years with a small number of elderly persons of 60 years and above representing 9.1%. Approximately 39.7% of the population are children forming the majority in the district. The district has approximately 196 communities with Kpetoe and Ziope being the major towns. There are about 7,020 households, 63.7% headed by males with 36.3% led by females and an average household size of 4.3 (Ghana Statistical Service, 2010).

Agotence-Ziope District shares boundaries with the Republic of Togo to the east and north, Central Tongu District, to the South and Adaklu District to the west. The district is occupied by two main ethnic groups. These are the Agotimes who are the majority and descendants of Dangme tradition and the Ewes. On the other hand, there are other ethnic groups such as the Akans, Fulanis, Togolese and people of Northern descent living in the district. The people in the district speak Dangme and Ewe, but English happens to be the official language.
Traditional administration in the district is led by the chieftaincy institution as held by the indigenous ethnic groups. There are two main traditional councils comprising Agotime and Ziope which have the potential force for mobilization for development and serve as unifying entities. A Paramount Chief oversees the traditional councils with village chiefs, sub-chiefs and their Queen mothers. In each traditional area, there are elected and appointed District Assembly and Unit Committees members who assist in the mobilization of community members for development and implementation of health interventions.

For health administration, the Agotime-Ziope District is divided into five health sub districts which are Afegame, Kpetoe, Keyime, Sarakope and Ziope. These operate under the leadership of the District Health Management Team (DHMT). Health services are provided by the Ghana Health Service through 17 health facilities comprising three health centres and 14 Community-based Health Planning and Services (CHPS) compounds. Generally, accessibility to health facilities in the Agotime-Ziope District could be described as good as these facilities are fairly well distributed throughout the district. It is also recognised that the introduction of CHPS compounds through the 14 zones address challenges of accessibility of professional health care services by people in the district (DHIMS -2, 2017). It is noteworthy that, residents additionally use the services of unconventional facilities such as spiritual and traditional healers when taken ill (Agotime-Ziope District Health Directorate, 2017).

The district is largely rural and citizens engage in agriculture as the dominant occupation. About 72.9% of the population is economically active and are engaged mainly in agricultural production like farming (92%) producing maize, cassava, vegetables for local consumption and marketing.
Livestock rearing is also practiced by about 40% of the residents whiles others are engaged in industrial production of Kente (35%). Few (3.1%) of the population are employed by the public sector but also carry out farming and petty trading.

The majority (85.3%) of the population in Agotime-Ziope district are affiliated with Christianity (74.2%) whiles African Traditional Religion (14.5%) and Islam (5.8%) are also practiced. Approximately 4.3% of the population of the district does not have any religious affiliation. The highest level of education attained by the majority of the people is primary (49.8%) with 17.8% having attained JHS/SHS status. About 75.5% of the population aged 11 years and older are literate with 24.3% have little or no level of education. The proportion of males who are literate is higher (85.1%) than females (67.2%).

Majority of the households in the district live in separate houses (50%) followed by compound houses rooms (34.5%) and huts on the same compound constituting 15.5%. These are mostly owned by a member of the household (Ghana Statistical Service, 2014; Population and Housing Census, 2012). Figure 2 below presents the map of Agotime-Ziope district.
3.4 The target Population

The Agotime-Ziope district was purposively chosen for this study mainly because it is one of the districts where malaria is endemic in the Volta region. Malaria transmission is widespread in the communities and increases during the rainy seasons from May to June and from September to November. Distribution of ITNs as a channel to promote malaria prevention and control have been on-going since 2010 through mass distribution, routine distribution at antenatal clinic to registrants, children between 18-24 months due for second round of measles immunization at the child welfare clinic and primary schools.
Selection of communities and participants was done adopting a two-prone or stage approach. At the first stage, one community was randomly selected using a simple random sampling technique from each of the five sub-districts. A total of five communities were included in the study. Though the district has a large number of communities, the decision to conduct the study in five communities was made based on the available time. Consultation with the district public health nurse and sub-district heads helped in the selection of the communities using the simple random sampling technique. All communities in each sub-district were listed on pieces of paper giving each community an equal opportunity to be included in the study. One community was picked from each sub-district. These five communities were Afegame, Agbagodo, Akpokope, Wudzereke and Ziope.

Stage two focused on selection of the participants at the community level. Community Health Nurses (CHNs) assisted in the selection of the participants for the five focus group discussions as well as the community leaders required for the in-depth interviews. Heads or spouses of households with children under five years were deemed eligible to participate in the study. A household according to literature is a person or a group of persons, who live together in the same residence, share the same house-keeping arrangements and are catered for as one unit (Ghana Statistical Service, 2014).

In getting the participants, Community Health Nurses recruited the eligible participants for the FGD sessions through sharing of notice at antenatal clinics and Child Welfare Clinics where target population are mostly found. Similar information about the survey was also shared during home visits and community meetings. The notice instructed household heads interested in participating in the survey to contact the CHNs for assessment of their legibility. Where the stipulated numbers were not obtained, CHNs with their prior knowledge of the community approached some households for participation.
Participants for in-depth interviews were selected based on the positions as chiefs, queen mothers, youth leaders in the community.

Between eight and twelve adult household heads or their spouses, 18 years or older were selected as participants for the FGDs in each of the five communities.

To have a comprehensive understanding of the community’s perception on factors influencing the level of ITN use, interviews were also conducted with key informants made up of one male and one female community leader in each of the five communities. In all ten personalities provided information on the topic under study.

### 3.5 Data Collection

Collection of data for the study was conducted by two research assistants under the leadership of the principal investigator. The two research assistants were recruited based on their professional background as health promoters and their experience in working with these communities. Nonetheless they were taken through a one-day orientation session as part of the field work preparation process. This concentrated on the rationale for the study, background information on ITNs and malaria, procedure for recording responses of participants as well as process for getting consents of participants.

Semi-structured guides were the main data collection tools used for the FGD and IDI during the study. The main themes explored in both the IDIs and FGDs included head or spouse of household’s knowledge on malaria transmission and prevention, perception affecting level of ITN use and the factors influencing the use of nets in the district. The guides were pre-tested in Kordzrala community in Keyime sub-district to assess its viability in responding to the research questions. However, it came out that the guides stimulated the desired response from the participants and consequently required no modification.
The choice of Focus group technique is particularly for its ability to provide information about how people feel, think or act in relation to malaria and the use of ITNs as prevention tool. The interactive nature of the technique additionally allowed participants to spontaneously express themselves and demand further clarification on issues.

FGD sessions were organised in June 2018 to afford adequate time for transcription of the information. One research assistant was responsible for taking notes whiles the second one made sure the digital recorder worked well. The principal investigator facilitated the moderation of the interviews in the Ewe language which is the local dialect spoken by all participants. Questions were translated into Ewe to ensure consistency. The period of discussions ranged between 50 minutes to 80 minutes depending on the participants’ level of sharing of new ideas relevant to the study objectives. Further questioning was done by the moderator for deeper insight especially when sensitive comments and responses emitted abnormal gestures and facial expressions by some participants. The discussions took place at locations that were easily accessible by participants and congenial for discussions including school compounds, health facilities and under trees.

Five sessions of FGD were organized with each group comprising between 8 to 12 adults above 18 years. This engaged 53 participants made up of 31 men and 22 women. More men participated in the study because most households in the district are headed by males (64%) with few (36%) headed by females (Ghana Statistical Service, 2010).

In-depth interviews were also held with opinion leaders including community elders, youth leaders, queen mothers and community-based volunteers to complement the FGD. The interviews provided an opportunity for the researched to achieve a multi-layered understanding of issues under discussion. Ten IDIs were held with one male and one female from the five selected communities.
A total of 20 community leaders participated in the interviews. Category of participants in both FGD and IDIs included community leaders including queen mothers, community-based health workers, men, women, teachers, and young people. All interviews and discussion sessions were recorded to assure the quality of data in addition to hand written notes by research assistants. Every participant was guided to individually complete a one-page background questionnaire that captured household demographic characteristics.

To ensure collection of relevant information based on the objectives of the study, a guide was developed and used as the main data collection tool for the FGD and IDI during the study. The main themes explored in both the IDIs and FGDs included level of knowledge of respondents on malaria transmission and prevention. This was obtained by finding out if any of their children had episode on malaria in the past and what made them feel the condition was malaria. Questions were asked to find out how the child was treated and means of preventing the child from getting malaria in the future including use of ITN.

The guide further solicited information on the factors that either motivate as well as prevent consistent use of the treated bed net at all time. Reasons for non-use of the ITNs were discussed and ways of improving acceptance and use of the bed nets were equally obtained. To get an in-depth understanding of information provided during the FGD sessions, interviews were held with community leaders using the same guide. However, probing questions were asked to elicit additional information on leaders’ observation and perception of ITN use by households.
3.6 Data Management and Analysis

Focus group discussions and In-depth interviews were audio recorded, transcribed verbatim in Ewe before translating into English.

This enabled the researcher to become familiar with the data, creating meanings out of the data and identifying possible patterns in the data. The transcription process also provided a thorough understanding of the information obtained from the field. This information was compared with the hand-written field notes taken by a second research assistant during the FGDs and IDIs for accuracy.

A researcher who is knowledgeable in both Ewe and English assisted in validating the transcribed and translated material to ensure precise transcriptions and translations. After proofreading and corrections, the transcripts for both FGDs and IDIs were protected with a password-protected computer and Google drives online platform.

The interview transcripts were entered into QSR NVivo 10 qualitative data analysis software. Analysis was done according to the framework for conducting thematic analysis. Codes were assigned to sections of the interviews and FGDs, key to the research topic and emergent codes were also generated to capture new themes that came up during the analysis with sub-themes. Themes represented some level of patterned response or meaning within the data. The word tree was also used to identify how each sub-theme connects or relates with the main theme. The relationship function was equally employed to understand the logic in the ideas presented by the respondents. In other words, the flow of ideas and how each idea connects with the previous ones was further analysed using the relationship function. The final thematic framework forms the structure of the findings and discussions and where applicable, verbatim excerpts from the transcript were used to illustrate the themes.
3.7 Ethical Consideration/Issues

Ethical approval was obtained from the Ghana Health Service Ethical Review Committee (GHSERC) with reference number GHS-ERC: 144/12/17. The GHS-ERC stressed the need for the study to obtain verbal or written consent from individual participants and the importance of maintaining confidentiality and anonymity.

Before each FGD and in-depth interview, an information sheet was read out to each person, to explain the purpose and objectives of the study, benefits, risks and freedom to participate or not, as well as issues relating to confidentiality and privileges of respondents in the local language using a written script. Every participant in both the FGD and IDI was given the opportunity to review the information and make a personal resolution to participate by either appending his or her signature or thumbprint. Participants were given the free will to withdraw from the study at any time and were made aware that no one was going suffer any consequences now or later if he or she decided to stop participating.

Permission for the study was also obtained from the District Health Directorate using a written request letter specifically to the district director of health services. Approval to conduct the study was again sought from traditional authority of each community with the support of the district coordinator of malaria control. Participants willingly and voluntarily took part in the study and were not given any form of monetary compensation. However, a bar of key soap was provided to each participant to facilitate proper washing of LLINs with mild soap.

The general procedure to seek consent and permission from participants and institutional leadership was approved by the Ethical Review Committee of Ghana Health Service.
CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION OF RESULTS

4.1 Introduction
This chapter discloses the findings from the data obtained through the semi-structured interviews among the five communities in the Agotime-Ziope District of the Volta Region of Ghana. Based on the objectives of the study, the results were organized into three main themes giving rise to their analogous sub-themes from the data collected. The socio-demographic characteristics of the respondents are also included in this chapter.

4.2 Socio-Demographic characteristics of participants
The study involved 53 participants within 5 communities (Afegame, Agbagodo, Akpokope, Wudzereke and Ziope), majority of which were males representing 59% and the rest (41%) were females. This was in line with the fact that most of the households (64%) in the district are headed by males with few (36%) headed by females. With reference to age groups of the participants, 49% comprising the majority of the participants fall within the age bracket of 30-39 years while 25% of them were between the ages of 20 – 29 years. Those participants within the age bracket of 40-49 years accounted for 15% with 9% being above 50 years. Only one respondent (2%) was below age 19. More than half of the participants were married (89%), with the remaining either divorced (6%) widowed (4%) or have never married (1%).

The Ewes are the dominant ethnic group (79%) with the rest belonging to the Agotimes (17%) and Karra (4%) ethnic groups. Generally, most of the participants (91%) have received some kind of formal education ranging from primary to tertiary. The study participants are mostly adherents of Christianity (89%) and traditional religion (11%).
Slightly more than 71% of the respondents were engaged in agriculture and its related occupations. The major agricultural products including maize, cassava, and vegetables are grown on both subsistence and commercial basis. Animal rearing is also undertaken by respondents focusing on cattle, sheep and goats for household consumption and commercial purposes. Apart from agriculture, almost 10% of the participants are involved in Kente weaving as additional source of income with most women engaged in other economic activities such as petty trading, hair dressing, dress making and bakery. The household size of participants in the study ranges from 2 to 11 with an estimated average of 4 persons.

Responses from participants revealed that households have ITNs ranging from 3 to 10. It was further revealed that, most of them have ITNs more than they require. The sources of these bed nets included ANC, CWC and the national point mass distribution campaigns. A table below shows details of the socio-demographic profile of the participants.
### Table 1: Socio-demographic Profile of Participants

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
<th>Frequency (n=53)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub District</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyime</td>
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<td>20</td>
<td></td>
</tr>
<tr>
<td>Ziope</td>
<td>1</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Sarakope</td>
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<td>20</td>
<td></td>
</tr>
<tr>
<td>Afegame</td>
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<td>20</td>
<td></td>
</tr>
<tr>
<td>Kpetoe</td>
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<td></td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Wudzereke</td>
<td>11</td>
<td>20.8</td>
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<tr>
<td>Ziope</td>
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<tr>
<td>Akpokope</td>
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<tr>
<td>Agbagodo</td>
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</tr>
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<td></td>
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<tr>
<td>Female</td>
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<td><strong>Age</strong></td>
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<tr>
<td>&lt; 19</td>
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<tr>
<td>20-29</td>
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<tr>
<td>40-49</td>
<td>8</td>
<td>15.1</td>
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<tr>
<td>50 +</td>
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<td>Widow(er)</td>
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<tr>
<td><strong>Educational Level</strong></td>
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<td></td>
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</tr>
<tr>
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<tr>
<td>Higher</td>
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<td></td>
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<tr>
<td>None/No formal education</td>
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<td>9.4</td>
<td></td>
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<td>0.0</td>
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</tr>
<tr>
<td>Christianity</td>
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<td>88.7</td>
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</tr>
<tr>
<td>Traditionalist</td>
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<tr>
<td><strong>Main Occupation</strong></td>
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<td></td>
</tr>
<tr>
<td>Kente weaving</td>
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<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Animal rearing</td>
<td>3</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Petty trading</td>
<td>3</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Civil servant (teaching/nurse)</td>
<td>2</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Self-employed</td>
<td>2</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>(mechanic/carpentry)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
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<tr>
<td>Ewe</td>
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<tr>
<td>Agotime</td>
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<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Karra</td>
<td>2</td>
<td>3.8</td>
<td></td>
</tr>
</tbody>
</table>
4.3 Primary themes generated from data

Data were analysed based on three main themes according to the objectives of the study and their corresponding sub-themes. These themes and sub-themes originated from the semi-structured interviews conducted and have been summarised in the table below.

Table 2: Themes and sub-themes generated from the interviews conducted.

<table>
<thead>
<tr>
<th>Main Themes</th>
<th>Sub-Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents knowledge on malaria</td>
<td>• Causes of malaria</td>
</tr>
<tr>
<td></td>
<td>• Signs and symptoms of malaria</td>
</tr>
<tr>
<td></td>
<td>• Management of malaria</td>
</tr>
<tr>
<td></td>
<td>• Adverse effects of malaria</td>
</tr>
<tr>
<td>Perception of respondents towards malaria</td>
<td>• Use of ITNs to prevent malaria</td>
</tr>
<tr>
<td>prevention</td>
<td>• Environmental management</td>
</tr>
<tr>
<td></td>
<td>• Other malaria preventive measures</td>
</tr>
<tr>
<td>Factors that influence the use of ITNs</td>
<td>• Motivation for use of ITNs</td>
</tr>
<tr>
<td></td>
<td>• Barriers to the use of ITNs</td>
</tr>
<tr>
<td></td>
<td>• Gender considerations</td>
</tr>
<tr>
<td></td>
<td>• Other uses of ITNs</td>
</tr>
</tbody>
</table>

4.3.1 Participants Knowledge on Malaria

The knowledge of an individual in a subject area is very crucial in making very important decisions and engaging in practices to improve health. Due to the importance of knowledge informing the overall health seeking and perception of individuals towards healthy practices, this study solicited respondents’ knowledge on malaria which emerged as one of the major themes from the transcription of data.
Under this theme are sub-themes such as 1) causes of malaria, 2) signs and symptoms of malaria, 3) management of malaria, and 4) the effects of malaria on the individual, family and society.

**4.3.1.1 Participants Knowledge on the Causes of Malaria**

All the respondents have varying understanding on what causes malaria. Some of these are rooted in culture, experience and exposure. Although most of the participants recognised that malaria is spread by mosquitoes, many also believe that malaria can be transmitted in other ways. It was found that, participants stated drinking dirty water, excessive exposure to sunlight, witchcraft, eating certain foods or drinking hard liquor as other possible causes of malaria. Below are some responses by participants, showing their understanding on the causes of malaria.

“Eating of too much oily food will definitely give you malaria....I have personally experienced this before....I suffered from malaria after eating oily food for like 5 or so days.” Male community leader, IDI, Ziope

“I identified that, one of my children always experiences malaria after eating oily food.” Female participant, FGD, Afegame

“Malaria can also be caused by drinking contaminated water......as such we do not have to drink water from every source”. Female participant, FGD, Afegame

“Eating contaminated food can make you suffer from malaria.” Male community leader, IDI Wudzereke

Some of the responses also suggested living in unclean surroundings can lead to malaria infection. Here are excerpts from responses made by participants echoing this impression.
“Malaria is caused by living in dirty environment. In fact unclean environment which breeds mosquitoes is surely a cause of malaria.” Male participant, FGD, Afegame

“Some people especially some particular women, they don’t like keeping their sleeping places neat and they refuse to sweep behind their houses. Their children always get sick from malaria.” Female participant, FGD, Ziope

Yet still, some of the participants suggested excessive exposure to the sun as the cause of malaria and the following responses highlight this;

“............... then exposure to the sun....if you sit under the sun for a long time” Male participant, FGD, Afegame

“We also need to minimize the amount of time we spend under the sun......because sitting under the sun brings about malaria paaaaa......this is because when you sit in the sun, it penetrates the skin and enters your blood stream and it changes the nature of your blood...then malaria can easily occur.” Male participant, FGD, Ziope

A male community leader stressed that:

“Since we are farmers, working very hard for long hours under the hot sun, we frequently have malaria. I believe scorch from the sun causes fever.” Male community leader, IDI, Ziope

However, majority of the participants identified mosquito bites being the cause of malaria, though they were not able to state the type of mosquito. Responses from the participants indicative of the above impression are stated below.

“Mosquitoes are the only cause of malaria.” Female participant, FGD, Akpokope

This statement was supported by all other participants in the Akpokope community during a FGD as they spontaneously mentioned mosquitoes as the cause of malaria.
Other participants from other communities such as Agbogado and Wudzereke also identified mosquitoes as causing malaria as presented below.

“Mosquito bite causes malaria. This I know because the nurses have said it several times and I have also experienced it.” Female participant, IDI, Agbagodo

“Mosquito bite can lead to malaria.” Male participant, FGD, Wudzereke

4.3.1.2 Participants Knowledge on Signs and Symptoms of Malaria

An individual’s ability to identify the clinical manifestation of malaria in time is very crucial to seeking treatment early and thereby mitigating the adverse effects of the disease on the individual, family and society. Responses vary from chills, vomiting, headache, bitterness in the mouth, dizziness, weakness, and loss of appetite to loss of taste, yellowing of the eye, passing of watering stool (yellowish stool), raise in body temperature, paleness to pain in the joints. Responses suggest that, most of the respondents were aware of the signs and symptoms of malaria with just a handful of them having views that were far from the true clinical manifestations of malaria. Below are the statements which emphasized respondents’ knowledge on signs and symptoms of malaria.

“Shivering, change of the colour of the eye (yellow), vomiting (yellow substance), unable to eat (loss of appetite), loss of taste when eating and passing out yellowish stool.” Male participant, FGD, Afegame.

“The person begins to feel cold, vomiting, shivering and unable to walk.” Female participant, Akpokope.

One other woman added that “High body temperature and vomiting are the symptoms of malaria” expressing her recent experience with her child who tested with malaria.
This was reinforced by a female participant from Wudzereke saying “They become very hot .... I mean very hot to touch” Female participant, FGD, Wudzereke.

A father from another community stated “Headache occurs in malaria.” Male participant, Agbagodo.

Some of the responses however seem remote from the signs and symptoms of malaria but rather represent long term effects of malaria when complications become eminent.

“The child becomes pale when he or she has malaria with yellowing of the eye.”

Female participant, FGD, Ziope.

4.3.1.3 Participants Knowledge on Management of Malaria

Having an in-depth knowledge about what actions to take in times of malaria are very important to curb the disease process, and hence, reducing the extent of adverse effects of malaria infection especially on children. Against this background, the study also explored the knowledge level of participants on the management of malaria. Results show that, interventions included seeking medical care from a health facility, use of over-the-counter drugs in the form of self-medication and use of herbal concoctions. The following statements throw more light on how malaria is managed among participants. As indicated some seek medical care from health facilities.

“When one is sick from malarial we send them to the hospital for testing.....and if they detect that its malaria ....they treat them.” Male participant, FGD, Ziope.

Others buy over the counter dugs as shown by the responses below:

“Some don’t have hospital card... or due to lack of money ... they go to the drug store and buy medications for treatment at home.” Male participant, FGD, Agbagodo.
“….If my husband does not give me money to send the child to the hospital…..I have to manage with what medicines we have at home.” Female participant, FGD, Afegame.

For some using herbal concoctions is one other way of managing malaria-

“Sometimes our old men mash some herbs like nim leaves in water and give it to the children who are sick to drink and they get well.” Male participant, Ziope.

“We sometimes resort to herbs which our fathers thought us. We burn local herbs for the sick person to inhale in a room.” Male participant, FGD, Afegame.

4.3.1.4 Participants Knowledge of the Effects of Malaria

Knowing the adverse effect of a disease condition can serve as a cue for behavioural change. This will help the individual have a positive attitude with regards to modifying ones behaviour to prevent the disease and avoid experiencing the effects of suffering the condition (disease). With this cognizance, the research intended to seek the views of participants on the effects of malaria. The results revealed that, the responses from the participants can be grouped into three main categories; effects on the individual, effects on the family and effects on the community at large. The following excerpts from the transcribed data highlighted the above insight.

Respondents stated varying degree of effects malaria has on the individual sufferer.

“…you are unable to work due to weakness (you become less productive)…..and the person might die if not treated early.” Male community leader, IDI, Afegame.

“…..you tend to waste money……..and if it affects children, they are unable to go to school (that’s if they are students).” Male participant, FGD, Wudzereke.
“...tiredness and weakness and can cause other problems to the body, also lead to loss of blood .........and it might lead to death if not treated early.” Female participant, FGD, Akpokope.

Results revealed that, loss of income, misunderstanding between family members, sadness, worries and pain among family members. The following statements throw more insights.

“.....it brings about worries to the family members because they might not be in the right financial standing to treat the person. And if the person dies, it also brings with it pain.” Male participant, FGD, Ziope.

“...as a parent, you will become worried if your child should be sick of malaria especially in the case where there is no money. Unless you resort to traditional herbal medicine.” Male participant, FGD, Afegame.

“It disturbs your flow of work, because if your child is sick as a mother, you would have to be by them to take care of them until they are well again.” Female participant, FGD, Agbagodo.

Participants also recognised that malaria can bring about misunderstanding between couples. A female participant indicated that:

“It disturbs the peace and tranquillity in the house as some fathers become angry at their wife for negligence.” Female participant, FGD, Akpokope.

Another female participant from a FGD noted

“Malaria and any other bring confusion between husband and wife especially where the husband cannot give money for the treatment of the child.” Female participant, FGD, Wudzereke.
A male participant expressed his frustration in the following statement:

“The fathers especially tend to use their monies in taking care of the sick child…also some of the fathers tend to borrow monies if they don’t have….and lenders worrying them afterwards.” Male participant, FGD, Ziope.

One woman mentioned that women become very worried when children especially are ill with malaria noting:

“……worries and fight between husband and wife……and also there is the spread of gossip in the community of poor parenting.” Female participant, FGD, Akpokope.

The effects of malaria on the community ranged to loss of human resources to instability in the community due conflicts among family members. A community leader in an interview lamented:

“……and if the person dies, it also brings loss of human resource.” Male community leader, IDI, Agbagodo.

4.3.2 Perception of Respondents about Malarial Prevention

4.3.2.1 Use of ITNs to Prevent Malaria

Participants mentioned various ways to prevent malaria. Although some respondents identified the use of fans in rooms, insecticide sprays, mosquito repellents and coils as well as burning of local herbs to drive away mosquitoes as a means of preventing malaria, responses from more than half of the participants indicated the use of treated mosquito net as their major means of preventing malaria. Examples of statements attesting to the conviction that ITNs prevent malaria are presented below:
“…..we sleep in mosquito nets to prevent malaria.” Male participant, IDI, Agbagodo.

“…..as parents, we should insist our children and even ourselves sleep in mosquito nets.” Male participant, FGD, Wudzereke

“We should take proper care of ourselves and sleep in the mosquito net, covering children with protective clothes such as long sleeves and trousers.” Female participant, FGD, Akpokope.

“You see, malaria can lead to a child having convulsion and even die. I always ensure that all my three children sleep under the bed net.” Female participant, FGD, Akpokope.

“Well, sleeping under a treated bed net is the only way to prevent malaria. The insecticide spray and mosquito coil give the children cold.” Female participant, FDG, Agbagodo.

4.3.2.2 Environmental Management as ways of managing Malaria

In addition to ITN use as means of preventing malaria, several participants mentioned environmental management as a way of controlling mosquito breeding. Mention was made of removing stagnant water bodies from households, clearing of weeds and bushes surrounding houses and burring of empty tins.

“Stagnant water that collects behind people’s bathrooms allows the mosquitoes to multiply. I think these should be removed.” A female participant FGD, Ziope.

In the same vein, some of the respondents stated, desilting of choked gutters, burying and emptying of unused cans, practicing of environmental hygiene and destroying breeding places of mosquitoes as methods to prevent malaria.
A statement from a male participant during an in-depth interview was corroborated by a female participant in a FGD indicating that:

“We should also destroy the breeding places of mosquitos, bury empty cans and fill open drains.” Male participant, IDI Ziope.

“We should weed our surroundings........also our bathrooms and its environs should be kept neat and devoid of stagnant waters. Women should make sure we sweep every still water around.” Female participant, FGD, Afegame.

Participants making reference to environmental management as channel for preventing malaria indicated that community members have some ideas about the epidemiology of malaria.

4.3.2.3. Other Measures for Malaria prevention

A handful of respondents stated, avoidance of oily foods, eating balanced and hygienic foods, drinking clean water and minimizing the amount of time spent in the sun as a way of preventing malaria. Observations from the responses revealed a trend in thought about what causes malaria and how to prevent its occurrence. As such, respondents mentioned avoidance or destroying what they thought was the cause of malaria. Below are what participants said regarding this sub-theme.

“We should make sure our children especially practice good personal hygiene.” Male participant, FGD, Ziope.

“Keeping sleeping places neat and clean to allow proper ventilation......also there should be a well laid drainage system.” Male participant, FGD, Aghagodo.
Other responses focused on participants’ idea on what causes malaria.

One male participant who stressed that malaria is caused by excessive sunlight advised that “we should do well to stay off from the scorching sun” Male participant, FGD, Ziope. Some others suggested that women should ensure availability of good drinking water and provide balanced diets to the family. “We should check the water we drink,” stated by a male participant from FGD, Ziope; and “…we should eat hygienic and balanced diet always,” emphasised by a male community leader, IDI Wudzereke.

4.3.3 Factors that influence the use of ITNs

This study further assessed participants’ use of ITN and the factors that affect the use of the ITN. Consequently, the study identified various factors which included the factors that motivate the use of an ITN; those that discourage ITN use and ways to mitigate the identified barriers to the effective use of the ITNs. Findings were grouped under the sub-themes; motivation for use of ITNs, barriers to using the ITNs, gender consideration and ways to mitigate the identified barriers.

4.3.3.1 Motivation for sleeping under ITN

This was one of the sub-themes that this study explored regarding the use of ITNs by households with children under five years. Participants were asked about what they would consider as motivation for using the ITNs and the results revealed the following among others; to prevent bites of mosquitoes and other insects; to reduce disturbance from mosquitoes, and to prevent sickness.

These responses came from respondents in both FGD and IDI sessions. The excerpts below give more acumen on the above;
“So that mosquitoes won’t bite me for me to get malaria.” Female participant, IDI, Wudzereke.

“So I can rest in peace without disturbance from mosquitoes, the medication in the net prevents them from biting me........Not only mosquitoes but from other malicious insects as well.” Male participant, FGD, Ziope.

“......I am afraid of children having malaria which is dangerous to their life. ITNs also kill other flies and insects like cockroaches. It is good to use it.” Male participant, FGD, Ziope.

“So that my children and myself will not fall sick easily. If they are good health you are happy.” Female participant, FGD, Agbagodo.

“....if I don’t sleep in the net, I feel am not secured because I am used to sleeping in bed nets and will fall sick. That is what I consider.” Female participant, FGD, Wudzereke.

“……the net serves as a barrier between the user and the mosquitos.” Female participant, Wudzereke.

Other responses that highlight economic gains from sleeping under the nets included:

“So that I won’t waste money on treating malaria.......so that I won’t waste my precious time being sick.” Male participant, FGD, Agbagodo.

“I don’t want my family members to fall ill that is to get malaria so I make sure we use the net. Otherwise we have to use all our money to go to the clinic.” Female participant, FGD, Akpokope.
“As for the bed net, it will make you sweat but for me it is better than having a sick child. Now that we don’t have money if your child fall sick, big trouble.” Female participant, FGD, Wudzereke.

Others claimed they use the bed nets since it has become their way of life.

“I personally sleep under the bed net every day because mosquitoes are always around. In fact it has become my style of sleeping.” Female participant, IDI, Agbagodo.

“…..you are inviting sickness for yourself if you don’t use the net, that’s why I use it always since my childhood.” Male participant, FGD Afegame.

Some other participants especially women noted that to avoid conflict with their partners, they ensured regular use of the bed net, since any time a member of the family is taken ill, women are blamed for negligence. This came out strongly through comments like;

“If a child becomes sick there is always misunderstanding between husband and wife especially in the case where the husband fails to bring money for the treatment of the child. Women are blamed for it. It becomes quarrel. Hmmm so we all sleep in the net” Female participant, FGD, Wudzereke.

Messages obtained during community education durbars and other education program on the severity of malaria on children was identified as a motivation to use ITN by participants. A female participant from Afegame community expressed her sentiment based on what she learnt from community education event.

“At the last PTA meeting, school children performed a drama on how a boy had to repeat his class because he did not go to school for a long time due to malaria, this made me decide to allow my children sleep in the bed net.” Female participant, FGD, Afegame.
4.3.3.2 Barriers to the Use of ITNs

This section outlined the various reasons identified by participants for non-use of ITNs aside its numerous benefits when we asked what could prevent households from sleeping under an ITN consistently. Responses revealed that, the reasons varied across the communities and focus groups. While some participants stated itching as the main reason for non-use of the net, others said they are unable to use the bed nets due to instructions regarding its use. Again some of the participants stated, feeling of heat, fear of the chemicals affecting their health, suffocation by the chemicals from the net as other reasons for non-use. These were accentuated by the following responses from the participants;

“Some say their face itches them when they sleep in the net due to the medication in the nets.” Female participant, FGD, Wudzereke.

A participant however, disagreed with the above assertions and said:

“Some don’t know how to use the net. The rule of using the net is that you should dry the net outside for a day before you start to use it. So when you use the net without following this rule, you will have problems with the medication in the net. Also when you wash the net, you need not dry it under the sun but in the shade so the medicine in the net would be retained.” Female participant, FGD, Afegame.

Other participants with past negative experiences indicated reasons for their inability to use the net. A female participant during a FGD in Afegame noted:

“Contrary to what has been said, I followed the rules judiciously and even gave it extra time but to no avail. I still experience the itch (irritation) any time I sleep in it so I decided to wash it but that also proved futile.” Female participant, FGD, Afegame.

Some participants stated that, the use of the net does not prevent mosquito bites entirely whiles others believe that mosquitoes bite not only in their sleeping places but outside their
rooms. As such they are not encouraged to use the net. The following responses emphasized the above.

“I can still get malaria when I use mosquito nets…… so I don’t see why I had to use it.” Male participant, Afegame.

“The problem now is the children who sleep and roll closer to the nets gets bitten by the mosquitos anyway. You see blood on the net in the morning.” Female participant, FGD Wudzereke.

“……because I am not naked or sleeping in the open, I don’t see the need to sleep with the net, yes that’s why: I think so.” Male participant, FGD Ziope.

“You see, before you go to sleep in the mosquito net, mosquitoes have bitten you already. We sometimes eat late so they start biting you. Also we stay outside to relax and converse in the evening, ohhhh they come to bite you. So we can get malaria.” Female participant, FGD, Wudzereke.

“Some of us go to church, evening service or all night though not always and the mosquitoes bite us before we get home to sleep under the net.” Female participant, IDI, Afegame.

Other reasons often given for not using the ITNs consistently included discomfort in the form of heat, allergy, and reactions while using the bed net. For instance, an elderly man expressed how he feels when sleeping under a treated net.

“I don’t sleep with the bed net. You sweat too much. This makes me not to like it at all.” Male respondent, IDI, Ziope.
Other participants in different FGD sessions stressed this feeling:

“They should educate us on how to reduce the medication content of the net so as to make usage comfortable. It creates too much heat and I feel burning sensation all over my body.” Male participant, FGD, Agbagodo.

“The bed nets given to us recently are very hard. So breathing becomes difficult when you sleep.” A female participant, FGD, Afegame.

However other respondents refuted the above assertion. A female participant during FGD session in Agbagoda indicated that:

“When you pack too many things in your room, air cannot blow, so it not the bed net that make people sweat.” Female participant, FGD, Agbagodo.

Some respondents were also of the view that, some weather conditions serve as hindrance to the use of the net. They use the net more during the raining season and less when the weather is dry and the mosquito population falls. This was evident from the following responses;

“...we do not use the net in the harmattan season......because the weather is windy, therefore there are scarcely mosquitoes” Female participant, FGD, Wudzereke.

Another participant echoed this sentiment saying;

“We don’t use the net during hot weathers...... there are also no rains to create breeding places for the mosquitos” Female participant, FGD, Afegame.

Some other participants however indicated that ITNs should be used every day as stated by a participant from Akpokope community.

“I use the net in all weather conditions because, either rain or shine, mosquitos don’t perish, just that their number reduces at certain times which does not necessarily mean that they are not there. Rather, they hide and come out during the night” Female participant, FGD, Akpokope.
Preference for certain shapes of bed nets by the suppliers was one other reason mentioned that hinder consistent use of ITN. A small number of participants preferred the conical nets instead of the rectangular nets commonly distributed by Ghana Health Service. Reasons for preferring the conical shapes include the fact that the rectangular nets cover too much space in the room and require extra poles to properly hang it. Stating this idea, a participant said:

“I find it difficult hanging the nets that the nurses give us. You would need extra poles to put on your bed to be able to hang it.” Male participant, IIDI, Ziope.

“Also our rooms are small so if you hang one of those bed nets, there is no space and I have to hang for the children as well.” Female participant, FGD, Wudzereke.

Participants noted that the structure of traditional houses present difficulties in hanging and using the ITNs. Comments such as these attested to this sentiment.

“The rooms/ house people hire have ceilings in them making it difficult to hang the net because the bed will be closer to one side of the room than the other. When this happens they become frustrated and then leave the net without using it.” Female participant, IDI, Kpeote.

“Lack of enough space in the room to hang the net is commonly mentioned by people as preventing them for using the net.” Male participant, IDI, Agbagodo.

“Also our rooms are small so if you hang one of those bed nets, there is no space and I have to hang for the children as well.” Female participant, FGD, Afegame.

Some community members complained about the quantity of ITNs owned by some households and faulted the modality of sharing the ITNs. They feel what is supplied is not enough for all members of the household and as such, stated that as a reason for non-use.
“The treated mosquito net given to me was not enough. I have three children, so we are five but I was given only three. It is not enough for the children some of them are grown.” Female participant, FGD, Akpokope.

However, many other households had large number of ITNs and yet are using few. The responses below illustrate this situation.

“Oh it is true. I have ten bed nets. You see when my wife was pregnant the nurse gave her one. Then when my son was born and they went to the clinic the nurse gave my wife another one. I also got three from Togo and recently we were given five and we are using two.” Male participant, FGD, Afegame.

“I have five bed nets that have the chemical and we are using two. I have three in my things.” Female participant, FGD, Wudzereke.

4.3.3.3 Gender consideration related to ITN use

Excerpts from the respondents provide further explanation on who uses the ITNs and who takes that decision. Almost all respondents identified parents most especially men as decision makers in net use. This was expressed by most female participants.

“......we the parents decide who to use the net.” Female participant, FGD, Agbagodo.

“.....my husband decides who sleeps in the net. He hangs it on the bed.” Female participant, FGD, Afegame.

“.....we the parents use the nets because the chemicals in the nets are harmful to the children.....at least we can bear the effects because we are matured.” Male participant, FGD, Agbagodo.

“......because we hang the nets on the sides of our bed....only we the parents especially fathers use it, because the children sleep on the floor.” Male participant, FGD, Ziope.
This notwithstanding, more than half of participants mentioned young children and pregnant women as needing to always sleep under ITNs in addition to everyone within the household.

“It is the women and their little children who need the nets. As for us men we can survive malaria.” Male participant, FGD, Afegame.

“Since the women sleep with the small children, they mostly use it.” Male participant, Ziope.

“Our children always have malaria and the nurses tell us to sleep in the bed net. So children have their net.” A female participant, FGD, Wudzereke.

Community perception of the male not being vulnerable to malaria also came out. A statement from a male participant illustrated this perception.

“I get surprised when I see men going to the hospital because they feel cold and have fever. Men are supposed to be strong and overcome fever easily.” Male participant, FGD, Ziope.

4.3.3.4 Use of ITNs for other purposes

The study also found out that, there were other uses of the net as identified by participants in both FGD and IDI, aside the intended use for malaria prevention. These included, using it in the farm as scare crow, using to protect seedlings in the nursery and fishing.

Participants assigned certain reasons to this action included those are old and torn nets, nets with holes, hard type of nets as ways of justification. The responses below give more insights for the above.
“I see people use the net to cover their animal pen and garden.” Male participant, IDI, Wudzereke.

“Bed nets can be sewn when torn but because they have more in their bags; people just use it for gardening when small holes appear.” Male participant, FGD, Afegame.

“Yes, people use it when nursing their vegetable seedlings and others use it as scare crow.” Female participant, FGD, Afegame.

“Children use it as fishing nets. And others also use it to fence their poultry birds.”

Female participant, FGD, Agbagodo.

“I see people use nets for those purposes. I think people use the tattered ones for the other purposes.” Male participant, IDI, Ziope.

“People use it in their farms as scare crow and other people also use it to tie their building............aside the above, they use them for other purposes but only old ones.”

Male participant, FGD, Afegame.

This reveals insufficient knowledge regarding proper care and maintenance of the ITNs by beneficiaries.
CHAPTER FIVE
DISCUSSION OF RESULTS

5.1 Introduction
This section discusses the study findings taking into account already established information on the subject provided by available and current literature in order to provide the needed theoretical context of the study. The purpose of the study noted in section 1.6 was to identify and document factors influencing the use of ITNs by households with children under five years in order to justify the modification role of education and behaviour change communication on the usefulness of ITNs in malaria prevention and control.

The research explicitly examined the household head’s knowledge about malaria transmission and assessed perceptions about malaria prevention in the Agotime-Ziope District. The study also explored the factors that determine the use of ITNs by the household heads. A qualitative approach was adopted with focus on descriptive cross-sectional dimensions.

5.2 Household Knowledge on Malaria
Efforts designed to control malaria requires updated knowledge and awareness about the transmission and epidemiology of malaria as well as the applicable measures for malaria prevention. The level of awareness about malaria among the communities in this study is appreciable. During the course of interview conducted, it was realised that knowledge of respondents on what causes malaria could be based on two factors, the mosquito as the agent that transmits the disease and the nature of the environment where one lives. Majority of respondents were convinced that mosquito bite is the main cause of malaria.
This very good level of awareness about the aetiology of malaria was equally identified in a study in Kenya where respondents acknowledged malaria as life-threatening which requires adoption of measures to prevent its onset (Malusha, Mwanzo, Yitambe, Mbugi, 2009).

The findings of the study confirm the concept of the Persuasive Health Message framework which states that when people have high level of awareness about a condition that is hazardous to their life, they willingly adopt measures to prevent it. In other words, respondents demonstrated that they recognise malaria as a threat to their well-being and therefore are prepared to adopt use of ITNs to prevent it.

A handful of respondents on the other hand identified circumstances within their immediate environment that cause malaria. These included consumption of foods items containing unsaturated oil, contaminated food and drinking polluted water, unhygienic surrounding and excessive exposure to the sun as the causes of malaria infection. It was realised that, most of these statements from respondents were based on past experiences and their view that such conditions are favourable to the breeding of mosquitoes. This goes a long way to explain the point that, though some respondents could not tell that, a bite from an infected anopheles mosquito causes malaria, they were very much aware of the environmental factors that contribute to the increased incidence of malaria in their communities.

These findings very much fall in line with findings in a Zambian study which revealed that, more than half of the respondents were sure malaria is spread to humans by mosquitoes infested with malaria parasites. Others attributed malaria to being drenched with water and long stay under hot sun in addition to the mosquito bite (Zingani, Mtonga, Chichonyi Kalunga, Mukosha, 2017). A similar study found that, a lot more of their respondents attributed malaria to mosquito bites whereas playing under the sun, dirty environment and drinking dirty water were mentioned as causes of malaria (Nyavor et al., 2017).
This was supported by another study in an urban–rural categorisation however revealed that, only 30.1% of the rural and 59.7% of urban community knew that mosquito bite can transmit malaria (Zewdie Aderaw, 2013).

These false impressions about the cause of malaria expressed by respondents in Agotime Ziope highlight non-recognition of the scientifically accepted mode of transmissions of malaria and this largely affected their level of acceptance of proven tools for malaria prevention especially the ITN. Over the years, community health workers have disseminated information on malaria and its cause among the people, so the persistence of the misconceptions on the cause of malaria could be attributed to their belief that the illness being referred to as malaria could be caused by other means apart from mosquitoes. On the other hand, lack of clarity and misinterpretation of the information on malaria transmission provided by the health workers may also be a contributing factor.

On the clinical manifestations of malaria, it came to light that, respondents knew most of the manifestations of malaria. Mention was made of headache, fever, loss of appetite, general body weakness, vomiting, and bitterness in the mouth among others. Though some of the responses such as yellow eyes and urine and looking pale may appear off the mark, they certainly stand as complications of malaria. Almost all the respondents being able to mention at least one sign or symptom of malaria was encouraging as this could be the alert signal for them to seek for care at an early stage of the disease process so as to prevent complications of severe illness and possible death. These findings were consistent with an earlier study by Nyavor et al., (2017) showing high level of knowledge about the signs and symptoms malaria.
When asked about management of malaria, responses gathered from the interview revealed that, most the respondents either used herbs, buy over the counter drugs or prepared other concoctions such as, boiling of herbs as a means of managing malaria. Additionally, it was found that, most of these respondents turned to the use of these methods for treatment because they could not afford money needed for effective treatment. Nevertheless, personal experiences on the effectiveness of these methods were equally an important reason why people resort to adopting them.

The findings of the study also suggested that some respondents manage malaria by sending their sick children to the health facility to receive modern medication and treatment; injections and tablets being the most common form of treatment. One could judge that for this group of respondents experience from the past and some level of knowledge on how detrimental untreated malaria could be informed their health seeking behaviour. This study therefore revealed that, the manner in which the respondents manage malaria was determined by their knowledge of what causes malaria (Musah-Kwaku, 2015).

This further suggests that, knowledge of the individual is an important factor that influences the health behaviour she demonstrates when faced with ill-health, for example malaria infection. This assertion supports existing literature that indicates that improved community knowledge of malaria and its source of transmission promotes preventive and personal protection practice among the affected community (Nganda, Drakeley, Reyburn, Marchant, 2009).

Being able to improve the knowledge of the individual on malaria can go a long way to decrease the incidence and overall prevalence of malaria.
This was confirmed by several other studies conducted in Ghana and elsewhere. These studies showed that effective utilization of ITNs largely depends on the knowledge level of community members about the cause and transmission of malaria (Musah-Kwaku, 2015; Oresanya et al., 2008; Thawani et al., 2009).

Respondents’ knowledge about the adverse effects of malaria on people was also explored in this study. Results show that, almost all the respondents know at least one effect of malaria either on the individual, family or community at large. On the effects of malaria on the individual, responses reported general weakness or malaise, inability to go to work or school or absenteeism from work or school, loss of blood (anaemia), financial loss due to cost of treatment, and even death if not treated early. With reference to effects on the family, anxiety among members, poverty and confusion or misunderstandings between parents were stated. Malaria was regarded as a huge source of worry to the people was ascertained from the following rather remote situations as absence of peace and tranquillity within the community due to continual misunderstanding between family members and gossiping and attribution of death to witchcraft and other unknown causes. This implies that respondents dully identified what malaria and its complications could be especially if not treated early.

All the respondents in the current study have either suffered from malaria before or had a child or relative experience the disease and as such are aware of the negative effects based on their past experiences. Experience certainly provides the opportunity for gaining new knowledge and for that matter, lessons from the pain malaria caused in the past could guide respondents in adopting the right approaches to preventing the disease such as regularly sleeping under ITNs.
This is because widespread non-use of ITNs and other malaria control measures tend to have negative implications for individuals and community as well as the nation as also found in other studies including that by Tobin-West & Kanu, (2016).

5.3 Household Perception on Malaria Prevention

Despite the misconceptions on cause of malaria, the results from this study show that ITNs are the most preferred measure for preventing malaria. Many participants described ITNs as effective in protecting people from the bites of malaria and other insects.

Respondents who thought malaria was caused by mosquitoes rightly suggested that the prevention of malaria could only be achieved by killing the mosquitoes, or destroy their breeding places. This group of respondents who formed a larger proportion of the sample therefore listed the following as the suitable ways for preventing malaria. Top of the list is the use of ITNs which was accepted as the most efficient measure of preventing malaria, followed by filling of empty drains, burying of empty cans and the use of mosquito repellents including sprays and coils to drive away mosquitoes.

Another study by the Ghana Health Service also found this as it stated that, more households embrace the use of ITNs as both physical protectors and chemical protective measure against mosquito bites (Ghana Statistical Service, Ghana Health Service, & National Public Health and Reference Laboratory, 2015). On the other hand, those who held the misconception that malaria was caused by eating oily foods and staying too long in the sun equally perceived the avoidance of such practices as the means to prevent malaria thus adopting other additional ways of malaria prevention. The findings of the present study were in agreement with a study that found 60.4% of people in communities adopting a combination of practices such as
sleeping under bed nets, pruning bushes around homes and spraying with insecticides. Only few (18%) stated using treated bed nets alone as way of preventing mosquitoes from biting them. The study therefore concluded that, respondents adopt multiple preventive measures due to the misconception that the disease can be transmitted by means other than mosquito bites which was also suggested by this current study in Agotime-Ziope (Zingani, Mtonga, Chichonyi Kalunga, Mukosha, 2017). Consistent with the present study is also a study conducted in the Coastal plain of Chiapas, Mexico which revealed that most of the respondents (98.1%) have used varied methods to prevent mosquito bites, out of which 94.3% used insecticide treated bed nets (Mora-Ruiz et al., 2014).

5.4 Factors that influence the Use of ITN

Insecticide treated net is a proven useful and effective intervention to fight malaria. Information from the study confirmed that a large number of households own at least more than one ITN, with some respondents possessing more ITNs than needed. The high level of ITN possession by households especially those with children under five years was equally found by the GMIS in 2016 and other studies (Ghana Statistical Service, 2016; Manu et al., 2017; Nyavor et al., 2017). The Agotime-Ziope District has experienced mass distribution of ITNs in recent times resulting in pushing more ITNs into households. This suggests there appears an over-supply of ITNs and it is expected that, this would encourage consistent use and support the concept of intra-community redistribution to those few households that may not have enough ITNs; that is if community members are ready to give up the extra nets they possess.

This study further examined the factors that affect participants’ use of ITNs. This brought out reasons that motivate households to use, factors that serve as hindrance to the use of ITNs.
Gender considerations regarding ITN use though not contained in the study objectives came out strongly. It is obvious that, the main motivation for the use of ITNs by households was to prevent malaria, its related complications and adverse effects on the individual and family. Households therefore consider using ITNs as means of promoting the health of the family, ensuring that children do not experience ill health as result of malaria, maintaining cohesion within the family. Some also have acquired use of ITNs over the years and have become part of their lifestyle hence continues its use. It is worth noting that once a person developed the habit of consistently sleeping under a treated mosquito net especially at early stage of development, it becomes incorporated into the person’s behaviour. These findings were consistent with a former study that stated that, community members perceived sleeping under ITNs as very beneficial especially as it protects pregnant women and their unborn babies from mosquito bite and hence malaria as well as provides sound sleep devoid of buzzing noise by mosquitoes (Manu et al., 2017; Musah-Kwaku, 2015). Equally, the Ghana Demographic and Health Survey revealed that, more of households embrace the use of ITNs as both physical protectors and chemical protective measure against mosquito bites (Ghana Statistical Service et al., 2015).

Majority of the respondents further noted that using ITNs as preventive measure against malaria is a cost saving measure since the cost of prevention is less than the cost of treatment which includes transportation, medication and time spent at the health facility. In the study area, economic activities are at the subsistence level with low income. Households therefore make economic decisions by weighing the cost involved in treatment and use of the net in relation to promoting the health of the family. Many other respondents especially women also perceive maintenance of peace and tranquillity as another benefit that drives the use of ITNs.
Households across the five study sites therefore get motivated to use ITNs taking into consideration multiple consequences.

This is in line with the Persuasive Health Message framework upon which the study is situated which proposes that people would adopt new health behaviours if they feel their health status are threatened. The findings of the study suggest that household heads use ITNs in order to prevent their children from being bitten by malaria which may result in ill-health, loss of income and time. In other words, households recognised the efficacy of ITNs in malaria prevention as highlighted by the theoretical framework as one of the constant factors. This concept facilitates people taking specific health actions such as acceptance and adoption of ITN use.

With all the reported benefits and obvious reasons to use the ITN, the study found that some respondents still remain adamant when it comes to the use of the net to prevent malaria. They gave various reasons for non-use even though the World Health Organization stressed that, insecticide treated nets (ITNs) are the backbone of all malaria prevention measures and are effective in preventing malaria morbidity and mortality in a range of epidemiological settings (World Health Organization Global Malaria Programme, 2014). The readiness of households to correctly use ITNs is vital in achieving this assertion. Yet, for many, sleeping under a treated bed net is uncomfortable as revealed by the study. Details given by these respondents included, excessive heat generated by the net, itching and irritations on the skin, a feeling of suffocation and fear of the chemicals affecting their eyes. Some others indicated having problems with hanging the net especially the rectangular bed nets as a hindrance to ITN use. In line with the current study, other studies revealed that Ghanaians have the perception about ITNs being uncomfortable to use (Baume & Franca-Koh, 2011; Galvin et al., 2011; Pulford et al., 2011). These technical obstacles focus on the ITN as an entity.
Many respondents stated that they are not using nets because of seasonal weather changes. This confirmed the widespread notion of ITNs use mostly during the rainy season when mosquitoes are perceived to be more visible and use ITNs less in the course of dry season when mosquitoes are not very visible. Community members are certain that after the rains, a lot fresher water bodies like those in the pot holes, ponds are seen around, serving as favourable conditions for mosquitoes breeding, putting people at higher risk of getting malaria. With this idea, people perceived high density of mosquitoes in their immediate surroundings in relation to the importance of using ITNs. On the other hand, the harmattan wind in the dry season and the accompanying hot weather do not support consistent use of ITNs. Another study conducted in Liberia also identified the seasonal use of ITNs (Babalola, Ricotta, A\vantang, Lewichy, Koenker, Toso., 2016).

Though respondents showed preference for conically shaped ITNs mostly in the big communities such as Kpetoe and Ziope, instead of the rectangular nets commonly distributed by Ghana Health Service, this may not be a major obstacle. Fondness of other shapes of ITN was found to have minimum influence on ITN approval, adoption and use (Koenker & Yukich, 2017).

Issues of ITN use and space in the sleeping room to hang the net were mentioned by respondents quiet over and over again. Houses in the communities have one structure and this is believed to have come from how their fore fathers built as such it was passed on to them. Continuing this type of building structure represents an important means of maintaining the culture of the community.
However, with this structure, accommodating larger family size presents technical obstacle hindering consistent use of insecticide treated bed nets as portrayed by Pulford et al., (2011). It is difficult for households to create new places for sleeping for older children and visitors which has implications for ITN use.

Additionally, variety of other uses for the nets was revealed during the present study instead of hanging the net on sleeping places to prevent mosquitoes and malaria. This newly identified but wrong usage of the net was attributed to the condition of the net as a deciding factor such as old and torn but is unacceptable. Care and repair of ITNs is an important way of prolonging the life span of a treated mosquito bed net. However, further inquiries reveal that, people tend to throw away nets or misuse them because they have them in excess. They do not see the need to mend and repair an ITN when a small hole appears. This disclosed insufficient knowledge regarding proper care and maintenance of the ITN by beneficiaries. Therefore, efforts should concentrate on addressing proper care and repair behaviour.

Household heads mostly men are seen in traditional society as wielding enormous power and make all the decisions concerning the wellbeing of the family. The study indicated that men are allowed to decide on who sleeps under a treated mosquito net. Society sees women and children as the weaker group as such should be supported to use the ITNs that are available in the household. This shows that community members appreciate the messages shared by health workers that children under five years and pregnant women as the population most at risk of malaria infection. The current study also detected that it was a requirement for women to make sure that ITNs are always in good condition and used by all household members, since they are socialised to maintain good health for all family members.
In the same way, women when pregnant are seen as highly susceptible to malaria and therefore need to ensure that sufficient ITNs are available for use in the home. Women therefore experience the highest burden of malaria so are motivated to promote ITN use. Men were also seen as less likely to use the ITN since they were not perceived as vulnerable. Participants expressed that bed net use by men was a symbol of weakness. These highlight the gender and age implications within the communities that impact on malaria prevention and ITN use in particular.

5.5 Limitations of the study

The study had some limitations that warrant mention. First of all, the data analysed was derived from a selected section of community members that utilised mainly qualitative techniques limited to FGDs and IDI. These captured the experiences, perception and knowledge from only 53 household heads or their spouses from five communities within the entire district. Though this small number of respondents provided broader in-depth understanding of the issues under study, the findings may not be representative enough of all communities in the districts. Ideally, all household members as a unit should have been involved in the study to generate a more representative perception on the study objectives.

Secondly, the responses were self-reported that are subjective to social bias. Household heads were not followed up to ascertain if they actually own and use the ITN. The research team members could have created case studies for selected FGD participants who indicated they use the ITNs, visit homes and make observations of the general sleeping arrangements and availability of ITNs. The effort would have helped in building on the information obtained from the FGDs. Again further discussions with community health nurses to obtain their perspectives on ITN use in the district could potentially enrich the data. It is the researcher’s believe that the vigorous data collection practices helped curtail these challenges.
The limitations notwithstanding, the study findings provide important lessons that form the bases for programming and drive evidence-based intervention strategies to neutralize negative factors as well as reinforce positive factors that emerged from the study.
CHAPTER SIX
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The study aimed at exploring the factors that influence ITN use by households with children under five years in the Agotime-Ziope District situated in the Volta Region of Ghana. It further assessed the knowledge level of household heads about malaria.

Generally, most people have very good knowledge about malaria, its transmission and practical measures of prevention. Majority of respondents were also knowledgeable in the cause, signs and symptoms and adverse effects of malaria. These people accepted malaria as a long time threat to life of everybody within the society with much emphasis on susceptibility of malaria based on non-use of ITNs. This notwithstanding, other respondents still had misconceptions about the cause, management and prevention of malaria. The study likewise identified the cues to net use at the household level and also described perception regarding ITN utilization in Agotime-Ziope District.

Information emerging from this study shows that households have sufficient ITNs. The high level of ITN ownership in the Agotime-Ziope District is an indication that the continuous distribution strategy adopted by Ghana through free distribution of ITN to the general population not only those deemed vulnerable is an efficient channel. This facilitates the achievement of the universal coverage recommended by World Health Organization.
Results from the study also demonstrated that ITN utilization has grown over the years due to multiple motivating factors outlined by the respondents. These included health improvement noting the severity of malaria; economic benefits regarding cost saving as cost of prevention is less than treatments cost; maintenance of peace and tranquility between couples; and contentment. However, use is still low compare to the large number of households owning ITNs in the district. Factors that discourage appropriate use are associated with ITN as unit of analysis, personal perceptions and other false impression. These ranges from perceived discomfort, ineffectiveness of ITNs to protect one against bites of mosquitoes, perception that mosquitoes are not always available to inability to hang nets because of its shape and limited space at sleeping places.

The findings of the study revealed that non-use of ITNs relates to people’s perception on the efficacy of ITNs in preventing their children under five years from experiencing malaria. These factors are in line with the culture component of the transient factors within the Persuasive Health Message framework. The framework illustrates that perceived attitudes and practices adopted by house heads could hinder effective use of ITNs to protect children less than five years against mosquito bites. This group of respondents could be motivated using persuasive communication strategy and messages to believe that a change in health behaviour will have an overall positive result. That is the acceptance of the use of ITN as an effective tool in malaria prevention would protect their children less than five years from malaria.

It was worth noting that, none of the five communities visited talked about any social norm, taboo or traditional restrictions that limit the use of the ITNs. However, the study highlighted how gender issues have bearing on ITN use.
Men were seen as less likely to use ITNs due to community norms whiles women have the responsibility to promote ITN use and provide care for household members who suffers from malaria.

One other socio-cultural factor focusses on the availability of sufficient ITNs to cover everyone within the household whiles other who have more find other uses for them. The findings suggest that the distribution modalities adopted by GHS allowed some households to have huge number of ITNs more than they required especially the mass supply channel. This channel does not focus on households which really need the bed net but provides to all households. This discrepancy has led to some community members having excess nets to use for other purposes, which is not acceptable.

6.2. Recommendation

Based on the results of this study, the following recommendations are made to leadership of malaria control and prevention institutions and other partners engaged in promoting ITN acceptance, use and management, especially at the community level.

- Although knowledge on malaria was noted to be appreciable, efforts should be made to increase peoples’ understanding of the severity of malaria and the threat it poses to all ages and gender, why the treated mosquito net is a viable tool to prevent malaria, the role of fathers and mothers in preventing malaria, and the effect of malaria on family health finance and development at large. This should be targeted at those who still have doubt about the usefulness of ITN in malaria prevention. Behavioural change interventions intended to promote the efficacy and benefits of net use and provide people with workable actions to overcome the barriers to net consistent use should be promoted through Social and Behavioural Change Communication activities as postulated by the Persuasive Health Message framework. Persuasive
messages should be developed by National Malaria Control Program and the Health Promotion Unit of Ghana Health Service, on actions that direct proper handling of the nets – removal from the package – airing- hanging.

- Ghana Education Service and school authorities can also assist in disseminating user messages on insecticide treated bed net, integrating malaria education into school activities and Parent Teacher Association meetings which were found useful channels of obtaining health information and messages.

- GHS/NMCP should consider reviewing the ITN distribution modalities that targets only households who actually need the nets. This would enable beneficiaries to value the usefulness of the ITNs in malaria prevention. Guidelines for disposal of nets that are perceived worn out and old should be developed and communicated to households.

- Individual households should adhere to technical instructions guiding how to use and maintain the bed nets including airing new nets for a specific period of time to reduce the chemical reaction.

- The council of chiefs including queen mothers should put in place local byelaws that would deter people from using the ITNs for other purposes with punitive measures to deal with recalcitrant community members. These bye-laws should be gazetted for effective implementation by the Agotime-Ziope District Assembly. Households with excess ITNs should be encouraged to give out the surplus nets to other members of family. Community-based volunteers in collaboration with CHNs should be
empowered to monitor use of ITNs by visiting homes to remind households to sleep under the bed net throughout the night.

- Establish a research program to document the concept of community acceptance of net use monitoring since effective monitoring of ITN hanging, use, care and management call for monitoring personnel getting in to household bed rooms. This would develop the most suitable and appropriate processes for regular monitoring of how communities accept, use and manage the free but very useful insecticide treated nets provided to them by the Ghana government and its partners in the Global Fund for AIDS Tuberculosis and Malaria.
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APPENDIXES

Appendix I: FOCUS GROUP DISCUSSION GUIDE FOR HOUSEHOLD HEADS/SPOUSE

“Use of Insecticide Treated Net among Households with Children under Five Years in Agotime-Ziope District”.

Moderator: ________________________  Note taker: ________________________

Date: ________________________  No. of participants: ________________________

Community: ________________________  Site: ________________________

Start: ________________________  End: ________________________

1. Have any of your child/ren had episodes of malaria before?

2. What made you think your child/ren condition was malaria?

3. What do you know about malaria? (guide participants to express their knowledge about cause of malaria, its transmission and impact on individual and family)

4. In what ways can you prevent your child/ren from getting malaria?

5. Do you allow your child/ren to sleep under ITNs? If Yes, Why and if No, why not?

   Guide participants to express their perception about the usefulness of ITN in malaria prevention or otherwise)

6. What problem do you encounter with the use of ITNs? (guide participants to express their personal reactions and comments, views and ideas about barriers to use of ITNs)

7. What will you consider before you allow your child/ren to sleep under a mosquito net (ITNs)? (encourage participants to express the factors that motivate them to sleep under the ITN; and practices that may influence parents decision to use ITNs for their child/ren)

8. Do you think your child/ren is completely protected under ITNs?
9. Do you have any other means of preventing mosquito from biting your child/ren other than ITNs?

10. Are there any times when the bed nets in your households are not used? When and why?

11. How do you decide who sleeps under the bed net in your home?

12. What cultural factors may influence your utilization of nets for your child/ren?

13. Does the climate condition in the community affect the utilization of nets for your child/ren?

14. What in your view can be done to improve the ITNs use?

15. Apart from using mosquito nets for sleeping, what are the other uses of the net?

16. What do you see other people use the mosquito nets (ITNs) for other than children sleeping under it? (this focus on other uses of ITNs by community members)

17. Is there anything else you would like to add to our discussion about malaria and bed net before we round up?
Appendix II: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

1. Community ____________________

2. Name of Household Head _________________

3. Sex □ Male □ Female

4. Age of household head _________________

5. Marital status □ Single □ Married □ Divorced □ Separated □ Other

6. What is your ethnicity? _________________

7. What is your religion? □ Islam/Muslim □ Christian □ Traditionalist □ Others
   (specify) _________________

8. Highest educational level attained □ Primary □ Secondary □ Tertiary □ None

9. What is your occupation? □ Farming □ Petty trader □ unemployed □ Others
   (specify) _________________

10. What is your household size? _________________

11. Do you have bed net (s) in this household? □ Yes □ No

12. Which type of bed net do you have?
Appendix III: INFORMED CONSENT FORM FOR HOUSEHOLD HEADS/SPOUSE

Principal Investigator: Vivian Ama Abiwu, School of Public Health, University of Ghana, Legon, Tel: 0246410334, email: vabiwu@jhuccpgh.org

Introduction
You are invited to participate in a focus group discussion on the study on “Use of Insecticide Treated Nets among Households with Children under Five Years in Agotime-Ziope District”. I am here with my research assistants and I will give you information and invite you to be part of this research. Before you decide, you can talk to anyone you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me.

Purpose of the research
The study is designed to explore household’s knowledge on malaria transmission, their perception and attitudes regarding malaria prevention. The study also aims at determining the factors that influence ITN use by in the study area, Agotime-Ziope District.

Procedures
If you accept, you will be asked to take part in a discussion with 7-8 other persons with similar experiences. I will guide this discussion. I will ask you questions about the mosquito nets use for your children and give you time to share your knowledge. I will not ask you to share personal beliefs, practices or stories and you do not have to share any knowledge that you are not comfortable sharing. The discussion will take place where no one else but the people who will take part in the discussion and I will also be present during this discussion. The entire discussion will be tape-recorded, but no-one will be identified by name on the tape. The information recorded is confidential, and no one else except other members of the research team will have access to the tapes. This study is purely an academic work which forms part of my requirement for the award of a Master of Public Health degree. The discussion will be held once and will take about one hour. The researcher has no conflict of interest in this study.

Voluntary Participation
Your participation in this research is entirely voluntary. It is your choice whether to participate or not. If you choose not to participate it will not involve any penalty. You are free...
to withdraw consent and discontinue participation in this discussion at any time without prejudice from the study team.

**Risks and Discomforts**

I do not anticipate any potential risks of participation to you. Most of the interview questions and discussions are not particularly sensitive. Nevertheless, if for some of the questions you feel reluctant to discuss them, you can choose not to answer or discuss any question, and you can choose to drop out at any time, even in the middle of the discussion. You do not have to give me any reason for not responding to any question, or for refusing to take part in the discussion. There will be no costs for participating in the discussion.

**Benefits and Reimbursement**

There will be no direct benefit to you, but your participation is likely to help me find out more about indications to effective utilization of mosquito nets for children under five years. You will not be provided any incentive to take part in the research. However, I will give you refreshment in the form of soft drinks and pastries for your time. It is hoped that experiences gathered at this discussion will be shared with policy makers, academia, and other stakeholders to improve education on the use of ITNs for children under five years.

**Dissemination of results**

Findings and recommendations would be available at the School of Public Health and it will also be disseminated through a meeting with different stakeholders at the end of the study.

**Confidentiality and Anonymity**

All information gathered from the discussion will remain confidential. Your identity as a participant will not be disclosed to any unauthorized persons. Any information about you will be coded and will be password protected. Nothing that you tell me today will be shared with anybody outside the research team, and nothing will be attributed to you by name. Any references to your identity that would compromise your anonymity will be removed or disguised prior to the preparation of the reports and publications. Apart from the researcher and supervisor of this research, no one else will have access to information provided whether in part or whole. Data collected will be stored under lock and key then destroyed after a minimum of three years as per research protocol.
Right to Refuse or Withdraw
You do not have to take part in this research if you do not wish to do so, and choosing to participate will not affect you in any way. You may stop participating in the discussion at any time that you wish without you being affected. I will give you an opportunity at the end of the interview/discussion to review your remarks, and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly.

Who to Contact
If you have any questions, you can ask them now or later. If you wish to ask questions later and or need further clarification concerning this study and/or the conduct of the researcher and research assistants, you may contact the principal investigator Vivian Ama Abiwu, Telephone number 0246410334: Dr. Alfred Yawson, School of Public Health, Legon, Telephone number 0206301049: and Mrs. Hannah Frimpong (Administrator), Ghana Health Service Ethical Review Committee Secretariat, Accra. Tel: 0507041223/0243235225.
Appendix IV: CERTIFICATE OF CONSENT FOR FOCUS GROUP DISCUSSION

I have been invited to participate in the research on “Use of Insecticide Treated Nets among Households with Children under Five years in Agotime-Ziope District”. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Name of Participant: __________________________

Signature of Participant: __________________________

Date: __________________________

I certify that I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the purpose of the study, procedures to be followed as well as risks and benefits involved.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher: __________________________

Signature of Researcher: __________________________

Date: __________________________
Appendix V: INFORMED CONSENT FORM FOR COMMUNITY LEADERS

Principal Investigator: Vivian Ama Abiwu, School of Public Health, University of Ghana, Legon, Tel: 0246410334, email: vabiwu@jhuccpgh.org

Introduction

I am a student from the School of Public Health, University of Ghana conducting a research on “Use of Insecticide Treated Nets among Households with Children under Five Years in Agotime-Ziope District”. My name is Vivian Ama Abiwu and I am here with my research assistants.

I will give you information and invite you to be part of this research. Before you decide, you can talk to anyone you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me.

The interview will take about 15 minutes of your time and ask you few questions regarding your health which may help improve service delivery. Issues to be discussed will include malaria and mosquito nets. All information collected will be treated as confidential and no one will be able to trace any information back to you.

Purpose of the research

The study is designed to explore household’s knowledge on malaria transmission, their perception and attitudes regarding malaria prevention. The study also aims at determining the factors that influence ITN use in the study area, Agotime-Ziope district.

Procedures

The study is actually targeted at households with children under five years and key opinion leaders in selected communities. It involves questions and responses. Questions to be asked include information about your background characteristics, knowledge about malaria, and information on ITNs, factors that influence you to use ITNs as well as the local attitudes and practices towards ITN use in your community. The discussion will take place where with no one else participating in the discussion.
The entire discussion will be tape-recorded, but no-one will be identified by name on the tape. The information recorded is confidential, and no one else except other members of the research team will have access to the tapes.

This study is purely an academic work which forms part of my requirement for the award of a Master of Public Health degree. The researcher has no conflict of interest in this study.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. If you choose not to participate it will not involve any penalty. You are free to withdraw consent and discontinue participation in this discussion at any time without prejudice from the study team.

Risks and Discomforts

I do not anticipate any potential risks of participation to you. Most of the interview questions and discussions are not particularly sensitive. Nevertheless, if for some of the questions you feel reluctant to discuss them, you can choose not to answer or discuss any question, and you can choose to drop out at any time, even in the middle of the discussion. You do not have to give me any reason for not responding to any question, or for refusing to take part in the discussion. There will be no costs for participating in the discussion.

Benefits and Reimbursement

There will be no direct benefit to you, but your participation is likely to help me find out more about indications to effective utilization of mosquito nets for children under five years. You will not be provided any incentive to take part in the research. However, I will give you refreshment in the form of soft drinks and pastries for your time. It is hoped that experiences gathered at this discussion will be shared with policy makers, academia, and other stakeholders to improve education on the use of ITNs for children under five years.

Dissemination of results

Findings and recommendations would be available at the School of Public Health and it will also be disseminated through a meeting with different stakeholders at the end of the study.

Confidentiality and Anonymity

All information gathered from the discussion will remain confidential. Your identity as a participant will not be disclosed to any unauthorized persons.
Any information about you will be coded and will be password protected. Nothing that you tell me today will be shared with anybody outside the research team, and nothing will be attributed to you by name. Any references to your identity that would compromise your anonymity will be removed or disguised prior to the preparation of the reports and publications. Apart from the researcher and supervisor of this research, no one else will have access to information provided whether in part or whole. Data collected will be stored under lock and key then destroyed after a minimum of three years as per research protocol.

**Right to Refuse or Withdraw**

You do not have to take part in this research if you do not wish to do so, and choosing to participate will not affect you in any way. You may stop participating in the discussion at any time that you wish without you being affected. I will give you an opportunity at the end of the interview/discussion to review your remarks, and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly.

**Who to Contact**

If you have any questions, you can ask them now or later. If you wish to ask questions later and or need further clarification concerning this study and/or the conduct of the researcher and research assistants, you may contact the principal investigator Vivian Ama Abiwu, Telephone number 0246410334: Dr. Alfred Yawson, School of Public Health, Legon, Telephone number 0206301049: and Mrs. Hannah Frimpong (Administrator), Ghana Health Service Ethical Review Committee Secretariat, Accra. Tel: 0507041223/0243235225.
Appendix VI: CERTIFICATE OF CONSENT TO PARTICIPATE IN IN-DEPTH INTERVIEW

I have been invited to participate in the research on “Use of Insecticide Treated Nets among Households with Children under Five years in Agotime-Ziope District”. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Name of Participant: __________________________

Signature of Participant: __________________________

Date: __________________________

I certify that I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the purpose of the study, procedures to be followed as well as risks and benefits involved.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher: __________________________

Signature of Researcher: __________________________

Date: __________________________
Appendix VII: IN-DEPTH INTERVIEW GUIDE FOR COMMUNITY LEADERS

“Use of Insecticide Treated Nets among Households with Children under Five Years in Agotime-Ziope District”.

Interviewer: ___________________  Note taker: ___________________
Date: ___________________  ID. of participant: ___________________
Community: ___________________  Site: ___________________
Start: ___________________  End: ___________________

1. Have any of your child/ren had episodes of malaria before?
2. What made you think your child/ren condition was malaria?
3. What do you know about malaria? (guide participants to express their knowledge about cause of malaria, its transmission and impact on individual and family)
4. In what ways can you prevent your child/ren from getting malaria?
5. Do you allow your child/ren to sleep under ITNs? If Yes, Why and if No, why not? (guide participants to express their perception about the usefulness of ITN in malaria prevention or otherwise)
6. What problem do you/people in this community encounter with the use of ITNs? (guide participants to express their personal reactions and comments, views and ideas about barriers to use of ITNs)
7. What will you consider before you allow your child/ren to sleep under a mosquito net (ITNs)? (encourage participants to express the factors that motivate them to sleep under the ITN; and practices that may influence parents decision to use ITNs for their child/ren)
8. Do you think your child/ren is completely protected under a ITNs?
9. Do you have any other means of preventing mosquito from biting your child/ren other than ITNs?

10. How do you decide who sleeps under the bed net in your home?

11. In your culture are there any cultural practices or beliefs about fever, malaria or bed nets? Tell me about it

12. Do these beliefs influence how you think about malaria or bed nets?

13. What in your view can be done to improve the ITNs use?

14. Apart from using mosquito nets for sleeping, what are the other uses of the net?

15. What do you see other people use the mosquito nets (ITNs) for other than children sleeping under it? (this focus on other uses of ITNs by community members)

16. Is there anything else you would like to add to our discussion about malaria and bed net before we round up?