PROVIDER AND USER PERSPECTIVES REGARDING BEDNETS DISTRIBUTION STRATEGIES TARGETING MALARIA VULNERABLE GROUPS IN KWALE AND MAKUENI, KENYA

JANET KARIMI NTWIGA (BSC. HONS)
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JUNE 2015
DECLARATION

This thesis is my original work and has not been presented for a degree in any other university

Signature ........................................ Date ........................................

Janet Karimi Ntwiga
Department of Community Health

SUPERVISORS

We confirm that the work reported in this thesis was carried out by the student under our supervision.

Signature ........................................ Date ........................................

Dr. Isaac Mwanzo
Department of Community Health
Kenyatta University

Signature ........................................ Date ........................................

Dr. Jane Chuma
Health Economist
KEMRI/Wellcome Trust – Nairobi

Signature ........................................ Date ........................................

Dr. Catherine Molyneux
Senior Social Scientist
KEMRI/Wellcome Trust – Kilifi
DEDICATION

I dedicate this work to my two children Imran and Habiba who had to bear with my absence as I embarked on this project.
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<tr>
<td>ACT</td>
<td>Artemisinin-based Combined Therapy</td>
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<td>AL</td>
<td>Artemether Lumefantrine</td>
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<td>AMREF</td>
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<td>Sub Saharan Africa</td>
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OPERATIONAL DEFINATION OF TERMS

Adults: These are people who are above the age of 18 years. At this age a person is expected to have some degree of independence to be capable of making decisions.

Bed net: This is any net used on the bed for protection against mosquito bites. It could be treated with a mosquito repellent or not.

Bed net distribution strategy: This is any method that is used to deliver the bed nets to the users.

Intermittent Preventive Treatment: this is a public health intervention aimed at treating and preventing malaria episodes.

Malaria Vulnerable groups: These shall consist of pregnant women and children aged below five years.

Roll Back Malaria: Its a global framework for coordinated action against malaria it forges consensus among key actors in malaria control harmonises action and mobilises resources to fight malaria in endemic countries.

Subsidy: This is a benefit given by the government to groups or individuals to keep the price of a product (bed net) low.

Women of reproductive age:

These are women who are between the ages of 18 – 49 years. Women of this age bracket are considered to be more likely to become pregnant hence being vulnerable to malaria.

Insecticide Treated Net (ITN):

This is a mosquito net that is pre treated with mosquito repellent. The treatment can last from six months to five years.
**ABSTRACT**

Malaria causes immeasurable human suffering in the tropics and the sub tropical areas. The disease is a leading cause for both mortality and morbidity with an estimated 300-600 million people being infected with malaria every year in the world. The World health Organization estimates that 90% of malaria deaths occur in Sub Saharan Africa. Insecticide Treated Nets (ITN) are a cost effective malaria control tool but coverage data has often showed that the majority of Sub Saharan countries are below the targets set by the Roll Back Malaria Initiative. While a lot of research has focused on the demand side perspectives of ITN uptake little has been done on the supply side factors affecting ITN coverage. This study establishes the distributor and user perspectives on ITN distribution strategies and whether they are reaching the poor and vulnerable to malaria. The study was descriptive cross sectional and was built on a larger study that explored access to malaria treatment and prevention among the poor. It was carried out in Kwale and Makueni Districts. Primary data arising from key informant interviews and semi structured interviews were used to gather the ITN distributor’s perspectives. Secondary data arising from two cross sectional surveys carried out by the wider study gave the user perspectives of the bed net access. STATA version 9.2 was used to analyze the quantitative data while the qualitative data was analyzed using the thematic framework analysis. The study identified three main distribution strategies: free distribution (distributed through the mass campaign and routinely by Non Governmental Organizations), Social Marketed subsidized nets and commercial distribution of nets. All the distribution strategies deal with limitations that could be supplier related, logistical, market related or organizational. The majority of retail outlets had stopped selling bed nets and retail owners described the bed nets as a very slow moving product. Slightly over a half of the respondents in Makueni and just above a quarter of the respondents in Kwale said they could afford to purchase a bed net (76 (54%) Makueni and 31 (17%) in Kwale). The free mass distribution was shown to have resulted in significant increase in bed net ownership in the two districts (from 88 (48%) to 124 (74%) in Kwale and from 76 (54%) to 102 (82%) in Makueni). In Kwale District people belonging to the high Social Economic Status (SES) were more likely to have benefited from the mass distribution exercise. In Makueni district, there was no association between a household’s likelihood of owning a bed net and its SES. Acceptability of bed nets was high in the communities studied. Statistical tests on the findings revealed that acceptability was related to bed net ownership. This study concludes that the mass distribution reaches the majority in a community and the strategy is effective at scaling up coverage in a short while. The commercial distribution strategy needs to be protected from collapse to ensure that bed nets are accessible and available throughout the year. Methods of ensuring that the poorest of the poor within the target groups are reached by all the strategies need to be explored to ensure that the poor benefit from the public health resources. Stringent monitoring and evaluation systems for existing distribution strategies need to be instituted to ensure early identification of bottlenecks, lesson learnt and correction for success of the program.
CHAPTER ONE: INTRODUCTION

1.1 Background
Malaria is considered the most important infectious diseases in the world killing approximately one to three million people each year. Worldwide some 300 to 600 million people are infected with malaria each year (Snow et al., 2005). The World Health Organization (WHO) estimates that of all the malaria deaths 90% occur in Sub-Saharan Africa (SSA). Malaria is both curable and preventable yet a large number of deaths and attacks of the disease are experienced especially in Africa (Meek et al., 2005).

Typically pregnant women and children aged below five years are considered vulnerable to the disease because of biological factors that weaken immunity making any attack life threatening (WHO, 2000). Similarly a poor person is vulnerable to the disease because they are less likely to afford measures to protect themselves or deal with the consequence of disease should it attack (Bates et al., 2004).

Insecticide Treated Nets (ITNs) have been identified to be a cost effective method of reducing malaria related morbidity and mortality (Heidi, 2006). They provide significant protection against early childhood mortality under a range of malarial settings and because of these, countries and the international community are advocating for ITN uptake among the malaria endemic regions (Lengeler, 2007).

Malaria is undoubtedly a world problem and it has elicited response from the international community. Various initiatives like the Roll Back Malaria (RBM), Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM), the Multilateral
Initiative on Malaria (MIM) and United Nations Children’s Fund (UNICEF) are working in partnership to reduce the burden of malaria. Common across all the initiatives is the recognition that ITNs form an integral part in malaria control.

The Kenyan government recognizes the threat that malaria poses to its economy and well being of its people (Government of Kenya [GOK], 2001a). The launch of the ITN strategy paper and the National Malaria Strategy (NMS) are key milestones in the fight against malaria (GOK, 2001b). In the year 2006 there was integration of ITNs into the measles campaign in Kenya and there are indications that this has resulted in improved coverage with ITNs (Mwangi and Auta, 2006). This study looks at the ITN as a malaria control strategy, zeroing in on different aspects of distribution as well as user perspectives about the distribution methods for the ITNs and which methods are actually reaching the malaria vulnerable groups with the ITNs.

1.2 Problem statement
Despite the recognition that malaria poses a threat to Kenya’s Economy and Kenya launching an ITN strategy paper in recognition of the role that ITNs play in preventing against mosquito bites that could lead to malaria, a country wide empirical study places ITN coverage among children under five years at 15% (Noor et al., 2006). Insecticide treated nets offer a unique opportunity of achieving the goal of reducing the malaria burden significantly because they are both feasible and cost effective (Lengeler, 2007). The Kenyan government like many other governments in Africa was part of the Abuja declarations on achieving 60% ITN coverage among the pregnant women and children aged below 5 years by the year 2005. The country has put in place several policies and strategies to enable achievement of these targets which have been increased to 80% by the year 2010. For example, in 2001 ITNs were
incorporated into the National Malaria Strategy (NMS) as an important malaria control tool. The ITN strategy paper was developed in the same year highlighting how ITNs would be scaled up in the country (GOK, 2001a). Population Service International (PSI) initiated social marketing of ITNs in 1999, making ITNs theoretically accessible for communities. Other initiatives include donation of free bed nets distributed to pregnant women in the majority of the malaria endemic districts (Guyatt et al., 2002) and integration of ITNs into the measles campaign.

Little has been done to establish what the providers of these interventions experience as they attempt to reach the vulnerable and what distribution channels are actually reaching the users. Unless challenges faced by the suppliers in the distribution process are addressed and the effectiveness of distribution strategy established, efforts to scale up ITNs will continue to yield poor results. This study will highlight which are the good strategies of reaching the most vulnerable with bed nets. Such information is essential if malaria control interventions are to benefit the most vulnerable groups to malaria.

1.3 Purpose of the study
This study will evaluate the distribution process and identify the bottlenecks in the delivery process as well as solutions to these challenges. Research into the supply side perspective of ITNs distribution is necessary and timely because it has been proven that coverage with ITNs is heavily influenced by the method of delivery (Snow et al., 1999). In addition the study will identify what strategies are most successful at reaching the people vulnerable to malaria with bed nets and why they are successful in order to inform policy. Ensuring that malaria control interventions reach the most needy will result in a reduction of the malaria burden in the country and eventually
resources being used for treatment and to mitigate the scourge of malaria would be freed up for other activities.

1.4 Objectives

General objective

To establish the distributors and user perspectives on ITN distribution strategies and its effect on access by the poor and vulnerable to malaria in Kwale and Makueni.

Specific Objectives

1. To identify the ITN distribution strategies being used by different distributors in Kwale and Makueni.

2. To explore the challenges that distributors face in their attempt to reach the poor and the vulnerable.

3. To explore ITN user views on the different ITN distribution strategies used to reach them.

4. To establish whether the most vulnerable groups to malaria are being reached by the ITN delivery strategies in use in Kwale and Makueni.

1.5 Research questions

1. What are the different ITN distribution strategies in Kwale and Makueni?

2. What challenges do different distributors face in their attempt to reach the most vulnerable?

3. What are the user’s views on the different strategies used for distributing ITNs?

4. What ITN distribution strategies are reaching the most vulnerable groups to malaria?
1.7 **Significance of the study**
Research on this topic is relevant and timely because several malaria endemic countries including Kenya have embarked on a combination of strategies for distributing ITNs in an attempt to scale up coverage. Results from this study identify the bottlenecks in the distribution process and possible remedies for the limitations in distribution. Such information may inform policy and would result in better targeting and distribution of the ITNs. With improved targeting and distribution of ITNs, coverage is expected to increase and result in a reduction in malaria burden in the country. The benefit of this cannot be over emphasized since the economic burden of malaria to a country and to an individual are enormous.

1.8 **Limitations of the study and attempts to address them**
A limitation of this study was that its targeted to get perspectives from the users and distributors of the bed nets only. Though it is true that the manufacturers of bed nets also have an influence ITNs reaching the vulnerable their insights were not sort because they were not among the targeted population.

1.9 **Conceptual framework**
Figure 1.2 shows a conceptual framework for exploring the different factors that have an influence on the effectiveness of ITN distribution strategies. Factors that influence or affect the ITN distribution strategy’s ability to reach the most vulnerable operate at three broad levels: community level, provider level and contextual levels (Boxes 1-3). Community level factors are factors that are specific to the society and which may promote or limit the delivery strategy. Examples of such factors include socio-economic status, literacy levels, believes and customs. The provider level factors are those things that are inherent in the distribution process like the price of the net, the communication or promotion strategy and objectives of the distributors. Contextual factors dictate the operating environment for the distribution strategy. Examples of
such factors include government support and infrastructure. All these factors operate at one or more of the three levels and are presented as level 2 in the framework.

The study explores in detail how each of these factors affects acceptability, awareness, availability, sustainability and affordability of ITNs. These five factors are presented as level 3 in the framework and are likely to determine effectiveness of a distribution strategy in reaching the malaria vulnerable groups with ITNs.
Figure 1. Conceptual framework

ITN Delivery Strategy

A. Community level

B. Provider level

C. Contextual level

Social Cultural and Economic aspects
- Believes
- Language
- Literacy level

Type of net
- Colour
- Shape/ size
- Bulkiness
- Pre treated or untreated

Charging strategy
- Cost of the net
- Competition from other strategies

Management of the program
- Monitoring the system
- Leakage to non targets
- Objectives of the program

Outreach activities
- Marketing/ communication
- Delivery points / outlets
- Infrastructure

Acceptability

Awareness

Availability

Sustainability

Affordability

Access to ITNs among the most vulnerable households
CHAPTER TWO: LITERATURE REVIEW

2.1 Overview of malaria

Malaria is a mosquito borne infectious disease of humans and other animals. It is caused by a parasite called Plasmodium, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells (WHO-UNICEF 2004). Symptoms of malaria include fever, headache, and vomiting, and usually appear between 10 and 15 days after the mosquito bite. If not treated, malaria can quickly become life-threatening by disrupting the blood supply to vital organs. Young children, pregnant women, people who are immune-suppressed and elderly travellers are particularly at risk of severe disease. Malaria, particularly P. falciparum, in non-immune pregnant travellers increases the risk of maternal death, miscarriage, stillbirth and neonatal death (WHO 2002)

Malaria is a global issue because it is found all over the world, with people in 109 countries at everyday risk of infection and approximately 250 million cases every year. In fact, every year, cases of malaria are reported from every continent of the world apart from Antarctica; moreover, there are concerns that in the face of climate change, more areas of the world will become suitable for transmission of malaria, making it even more widespread (Snow et al., 2005). Malaria occurrence in the world is mainly dependant on climatic factors such as temperature, humidity and rainfall. Globally is transmitted in the tropical and subtropical areas. The highest transmission of malaria is found in Africa
South of the Sahara and in parts of Oceania such as Papua New Guinea.

Figure 1.2: Global prevalence of Malaria

Malaria occurs worldwide, the figure 1.2 shows that malaria is heavily concentrated in what are categorized by WHO as the African, South-East Asian, and the Eastern Mediterranean regions (WHO, 2002).

Malaria is the leading cause of morbidity and mortality in Kenya. 25 million out of a population of 34 million Kenyans are at risk of malaria. It accounts for 30-50% of all outpatient attendance and 20% of all admissions to health facilities. An estimated 170 million working days are lost to the disease each year (GOK 2001a). According to the same paper, Malaria is also estimated to cause 20% of all deaths in children under five. The most vulnerable group to malaria infections are pregnant women and children under 5 years of age.
Malaria and poverty are intimately connected. In fact malaria is referred to malaria as a disease of poverty. It is concentrated in the poorest countries of the world. Controlling for factors such as tropical location, colonial history, and geographical isolation, countries with intensive malaria had income levels in 1995 of only 33% that of countries without malaria, whether or not the countries were in Africa (Gallup and Sachs, 2001). It disproportionately affects the poorest of the poor who are mainly found in remote, socially and culturally marginalised areas (Barat et al., 2004). Until recently the relationship between malaria and poverty received little attention. A review by Worrall et al., (2005) found that there was a link between poverty and use of preventive measures such as ITNs and expenditure on chemo-prophylaxis, there is a strong link between poverty and treatment seeking behaviour with poorer groups more likely to self treat, and incidence of malaria is unrelated to socio-economic status but even so the ability of individuals to access treatment promptly is an important determinant of health outcome.

2.1.1 International response to malaria
The rapid escalation of malaria in sub Saharan Africa prompted international interest in malaria especially because malaria burden can be reduced significantly using existing preventive and treatment strategies (Meek et al., 2005). The launch of the Roll Back Malaria (RBM) initiative in 1998 by the WHO was an important milestone in the fight against malaria. The Global Strategic Plan (GSP) 2005-2015 launched in 2005 blueprints the course that all partners must take to achieve the RBM global targets as well as realize 6 out of 8 Millennium Development Goals (MDG) i.e. Eradicate extreme poverty and hunger, Promote gender equality and empower women, Reduce child mortality, Improve
maternal health, Combat HIV and AIDS, malaria and other diseases, Develop a global partnership for development (AMREF, 2006).

In Summary the RBM strategic plan for the years 2005 to 2015 were that: by the year 2005; there will be a 60% coverage among the vulnerable groups with recommended treatment and prevention measures, by the year 2010 80% of people at malaria risk are protected by locally appropriate vector control methods (ITNs, indoor residual spraying and environmental management) 80% of malaria patients are diagnosed and treated with effective anti-malarial medicines, such as Artemisinin-based Combination Therapy (ACT), within one day of the onset of illness. 80% of pregnant women in areas of stable transmission receive Intermittent Preventive Treatment (IPT) and Malaria burden is reduced by 50% compared to 2000. By the year 2015 Malaria morbidity and mortality is reduced by 75% in comparison to 2005, not only by national aggregate but particularly among the lowest socio-economic groups. Malaria-related MDGs are achieved, not only by national aggregate but particularly among the lowest socio-economic groups. There is universal and equitable coverage with effective interventions (AMREF 2005).

RBM places emphasis on equity in coverage and access with either preventive or curative services. It seeks to ensure that poverty does not serve as a barrier to proven interventions and places great emphasis on the use of ITN as a cost effective and feasible method to protect oneself against malaria (WHO, 2002).

The United States has supported anti-malaria programs since the 1950s. Global malaria received greater attention in 2005 when President Bush launched the President’s Malaria Initiative (PMI), a five-year plan to expand U.S. malaria efforts. In 2005, in response to
growing international calls for global malaria control and to the success of the President’s Emergency Plan for AIDS Relief (PEPFAR), President George W. Bush launched the President’s Malaria Initiative (PMI), which aims to halve the burden of malaria morbidity and mortality in 70% of at-risk populations in sub-Saharan Africa by 2014. PMI brought significant new attention and funding to U.S. malaria programs and made the United States one of the largest donors for malaria efforts (Alexander 2012).

There is evidence that the growing international response to malaria has had some success in controlling the epidemic. Since 2000, global malaria incidence has decreased by 17% and malaria mortality by 26%. Since 2000, 43 countries have reported a reduction in reported malaria cases of more than 50%, including eight African countries that have experienced 50% reduction in either confirmed malaria cases or malaria admissions and deaths (WHO 2011). The decreases in each of these African countries are associated with intense malaria control activities. Despite these successes, several key issues pose challenges to an effective scale-up of the response to malaria. First, increasing reports of drug-resistant malaria in Southeast Asia and insecticide-resistant mosquitoes, largely in Africa, threaten the success of malaria control programs. Second, weak health systems, including shortages in health care personnel and inadequate supply chain networks, have limited the delivery of essential commodities for malaria control (Alexander 2012). There is also debate within the global health community over whether malaria efforts should increasingly target areas where malaria elimination is possible or whether efforts should remain concentrated on malaria control.
2.1.2 Kenya’s Response to malaria

Kenya has made progress in malaria control over the last 10 years, however the country is still far from defeating the fight. Compromising this fight are factors such as poor knowledge about the disease and lack of enough diagnostic equipment in the health facilities. Many women are also not taking the antimalarial drugs during pregnancy (WHO 2011). The figure 2.2 below shows the distribution of malaria in Kenya.

Source: CDC

Fig 2.2 Prevalence of Malaria in Kenya

The government of Kenya has instituted a number of responses to the malaria burden over time. In 1992 the ministry of health began to develop a National Malaria Plan of Action. The Health Sector Strategic Plan (HSSP) in 1999 defined malaria as the highest
priority for prevention and treatment (GOK, 2001). The following year 2000 the president together with other African heads of state committed to increase ITN coverage up to 60% among the pregnant women and the children below five years (Abuja declaration) and the Division of Malaria Control was formed (DOMC) (Guyatt et al., 2002). Some of the work of the DOMC was the launch of a National malaria strategy paper and an ITN strategy paper in 2001. Under the DOMC 70,000 free bed nets were distributed for the first time to pregnant women in 35 districts (Mwangi and Auta, 2006).

The government is committed to the control and prevention of malaria. To this effort, it has developed the National Malaria Strategy (NMS) document outlining several intervention measures. The four intervention measures outlined in the NMS are 1) management of malarial illness; 2) vector control by use of insecticide-treated mosquito nets (ITNs) and other methods, such as indoor house spraying; 3) control of malaria in pregnancy; and 4) control of malaria epidemics (KDHS 2008). A key factor influencing malaria infections and impact is vulnerability. These are factors that lead to variation in the impact of disease between different communities or individuals. The factors could either be biological, for example, individual immunity or institutional including inadequate health services (Bates et al., 2004). Another factor affecting vulnerability is economic status. WHO has identified 1.2 billion people living in absolute poverty as being the most vulnerable to infectious diseases like malaria, Tuberculosis (T.B.) and HIV (WHO, 2002). In an attempt to identify target groups more precisely, health programmes have focussed on biologically vulnerable groups like children under five years and the pregnant women. It is however necessary to consider economic
vulnerability when targeting interventions because the poor are more likely to suffer a heavier burden of disease.

Some key strategies being employed in the fight against malaria in Kenya are:

a) **Intermittent preventive treatment of malaria in pregnancy**

Malaria infection due to Plasmodium falciparum during pregnancy is an important determinant of maternal anaemia, abortion, stillbirth, intrauterine growth retardation and low birth weight, an important risk factor for neonatal and infant mortality (Steketee et al., 2001). However, the use of IPT during pregnancy in areas of unstable or seasonal malaria transmission has not been recommended (WHO 2004). Moreover, resistance to SP in many countries in SSA and its replacement with the more expensive artemisinin-based combination therapies has posed a major threat to IPT implementation for the prevention and control of malaria during pregnancy (Mutabingwa 2005). Government policy calls for pregnant women to receive two doses of intermittent preventive treatment (IPT) in the second and third trimesters in order to reduce the risk of malaria infection. IPT using sulphadoxine and pyrimethamine (SP) (Fansidar) was introduced in Kenya in 1998 as a replacement to chloroquine prophylaxis, because of very high levels of chloroquine resistance. All pregnant women living in areas of high malaria transmission are supposed to receive two doses of SP. Although Kenya adopted IPT as national policy in 1998, to date there has been limited assessment of the implementation of this policy in rural areas where the greatest burden of malaria is found (Guyatt et al., 2004). The KDHS in 2003 reported that in Kenya only 4% of pregnant women had received IPT during their antenatal care visit.
b) Malaria case management among children

Anti-malarial treatments include chloroquine, primaquine, and artemisinin-based combination therapy (ACT). ACT is the preferred treatment in areas with particularly deadly forms of malaria or with drug resistance to earlier generations of anti-malarials. Multi-drug resistant malaria is found worldwide, and there is evidence that ACT resistance is occurring in Asia. Malaria ranks amongst the most frequently diagnosed among out-patient, in patient and deaths in most districts. It is estimated that there are 8.2 million malaria outpatient diagnoses in GOK health facilities each year (GOK 2001a). In 2004 the country changed its first line treatment for uncomplicated malaria from sulfadoxine-pyrimethamine to Artemisinin based Combination Therapy (ACT) due to drug resistance. However, both the access to diagnostics and coverage of ACT for management of malaria is still low in the country. Health facilities also continue to experience frequent stock outs of ACT due to distribution bottlenecks (GOK-WHO-UNICEF 2009). In 2010, the major change in malaria case-management policy in Kenya was a shift from presumptive treatment of fevers to universal parasitological diagnosis and targeted treatment with artemether-lumefantrine (AL) (Zurovac et al., 2013). However, the success of the implementation of the new case-management policy is dependent upon series of factors of which availability of commodities at health facilities and case-management practices are of vital importance to ensure cost-benefit of the diagnostics and ACT based case-management strategies (ACTwatch 2009). In 2009, Kenya launched the new 2009–2017 National Malaria Strategy (NMS) whose case-management mainstay is parasitological testing of all febrile patients across all age groups and areas that are malaria endemic and treatment of only test positive patients
with nationally recommended ACT – AL. Simultaneously, by 2013, the new NMS specified programmatic directions to ensure universal availability of AL and malaria diagnostics as well as universal health worker’s adherence to the new malaria case-management guidelines (MOPHS 2009).

c) Other vector control methods

The vector control strategies in addition to use of ITNs are; source reduction through larval control, personal protection through the use of mosquito coils and cream repellents and environmental management through approaches to ensure minimal breeding in agricultural schemes such as irrigation or dams (GOK 2001a). Indoor Residual Spraying (IRS) involves covering household walls with an insecticide to kill any mosquito that comes into contact with the surfaces for several months. To be effective, IRS must be applied to a high percentage (80%) of household surfaces. Resistance to insecticides is a growing concern.

d) Insecticide Treated Net for malaria prevention

Bed nets form a protective barrier around people sleeping under them. However, bed nets treated with an insecticide are much more protective than untreated nets. High community coverage with ITNs reduces the numbers and life span of mosquitoes because a treated net not only repels but kills mosquitoes. When this happens, all members of the community are protected regardless of bed net ownership (Kolaczinski and Hanson, 2006). Nets may vary by size, shape, color, material, and/or insecticide treatment status. Most nets are made of polyester, polyethylene, or polypropylene. Only pyrethroid insecticides are approved for use on ITNs. These insecticides have been shown to pose very low health risks to humans and other mammals, but are toxic to insects and kill
them, even at very low doses. Pyrethroids do not rapidly break down unless washed or exposed to sunlight. Previously, nets had to be retreated every 6 to 12 months, or even more frequently if the nets were washed. Nets were retreated by simply dipping them in a mixture of water and insecticide and allowing them to dry in a shady place.

Pyrethroid-impregnated bed nets and curtains reduce man-vector contact by acting as a physical barrier and by repelling mosquitos and driving them out of houses. Impregnation improves the effectiveness of a torn bed net and prevents mosquitos from feeding on a limb which may touch the bed net during the night (Majori et al., 1987). ITNs have been proven to reduce peripheral and placenta paracetemia, increase birth weight and decrease the risk of foetal loss in women in their first to fourth pregnancies (Gamble et al., 2006). An empirical study in western Kenya proved that use of ITNs reduced mortality of 1-59 months old children by 27% while a Cochrane review showed that on average there is a 17% reduction in all cause childhood mortality as a result of using the ITNs (Phillips-Howard et al., 2003, Lengeler et al., 2007).

Much effort is currently being directed towards stimulating the demand for ITNs in African communities (RBM 2004). One of the key reasons cited for this is that when used properly, in fact ITNs provide almost complete protection from mosquito bites (Curtis et al., 1996). Several studies have also demonstrated the efficacy of ITNs with an overall reduction in all-cause mortality by 19% (Rashed et al., 1999). Despite their clearly demonstrated effectiveness, the current rates of net coverage remain disappointingly low in many African countries, especially among the poorest households (Goodman et al., 2000). There has been much debate over the extent to which the price of a bed net acts as a barrier to use. Simons et al., (2002) explored the extent to which reform of tariff and tax
policy can be expected to increase ITN purchases. It was predicted that reducing tariffs on insecticides on ITNs from 42% to 0% and the tariff on netting materials from 40% to 5% would lead to an increase in the demand for ITNs by 9–27%. Although there are limited studies measuring the extent to which the retail price of ITNs acts as a barrier to their use, we do know that in many African settings the upfront cost of protecting an entire household with ITNs typically exceeds ability to pay (Guyatt et al., 2002).

Coverage with ITNs in most African countries is below the RBM target of 60% among the vulnerable populations by the year 2005. In countries surveyed between 1997 and 2001 in Africa, a median of 13% of households possessed one or more nets whereas a median of 1.3% of households surveyed owned at least one ITN (Monarsch et al., 2004). A country study across four districts in Kenya indicates that coverage of pregnant women with ITNs in 2001 was 15% (Noor et al., 2006). A longitudinal study carried out between 2004 and 2006 indicated that bed net coverage in Kenya had increased to 67.3% after a mass distribution exercise (Noor et al., 2007). The same study indicated that there was a reduction in socio-economic inequity in bed net ownership. Gender plays an important role in the demand for bed nets. It has been argued that when women are pregnant, they fall into a high-risk malaria group. In turn, they receive greater exposure to health services and gain a higher level of awareness of the disease and ways of preventing it (Rashed et al., 1999).

Challenges do exist on how to ensure that the needy and the vulnerable population access and use ITNs. Several studies have focussed on demand for ITNs and the key findings from these studies include: Acquisition and usage of untreated nets in Nigeria was low while that for ITNs was even lower and few people had heard about ITNs (Onwujekwe et
Social marketing has performed very well in towns while performing poorly in villages. However where nets are given free of charge coverage in the villages have been shown to be very high (Maxwell et al., 2006); Expenditure on ITNs distributed through the public health care system was found to be inequitable while that for untreated nets mainly sold through commercials sector was found to be equitable in Sudan (Onwujekwe et al., 2005); Within a poor society vouchers for ITN may not necessarily increase health equity, at least at first because some cash is needed when using the vouchers as a part payment (Mushi et al., 2003); and coverage of pregnant women in Kenya with ITN was less than 10% of the targets set by RBM for 2005 (Alaii et al., 2003). In various health prevention is largely said to be better than cure/treatment. The cost-effectiveness of ITNs relative to other forms of malaria prevention and treatment has also been widely reported (Phillips-Howard et al., 2003)

2.2.1 Implications for equity during distribution of bed nets
To this study equity is very important because unless the ITNs are made accessible to even the disadvantaged groups then universal coverage and scaling up will not be achieved. There are various strategies for delivering ITNs to the vulnerable groups. These are: public sector, nongovernmental organizations, social marketing and commercial market (Chavasse et al., 1999). Although initial strategies to scale up insecticide-treated nets (ITNs) relied on cost-recovery, social marketing and targeted distribution strategies (focused on biological and socio-economically vulnerable groups), increased funding has allowed for universal free bed net distributions in many SSA countries. Although initial strategies to scale up insecticide-treated nets (ITNs) relied on cost-recovery, social marketing and targeted distribution strategies (focused on biological and socio-
economically vulnerable groups), increased funding has allowed for universal free bed net distributions in many SSA countries (Sexton 2011). Supporters of universal free bed net distribution have consistently favoured the strategy as the most feasible way to equitably reach the poor with the life-saving interventions. They argue that cost sharing and targeted interventions dampen demand, enhance inequities and consequently exacerbate the malaria burden. Despite their arguments, there are potential pitfalls. First, the claim that free bed net distribution enhances equity is mainly based on limited case–control studies which may be unrepresentative of real-world conditions (Growbosky 2005). As a result, such studies are not necessarily generalizable because of infrastructural and large-scale programme implementation challenges which may threaten the feasibility of reaching out to those most in need. Secondly, given the current global fiscal austerity measures sparked by the global economic recession and the concomitant over-reliance on international development assistance, the long-term consequences of this strategy in terms of its sustainability remain uncertain (Ordnioha 2012). A recent study from Malawi reported that people living closest to the health facilities were most likely to have bed nets than those living far away from health clinics (Larson et al., 2012). Another study in Zambia reported households with a woman having attended antenatal clinic or with children under five years old were twice more likely to have bed nets than those without (Larsen et al., 2010). In Angola, people residing more than 15 km outside the capital city of Luanda were almost six times more likely to test positive for malaria when screened at the health clinic than those living in the inner-city (Thwing et al., 2009).
The debate on what delivery mechanisms will ensure targets set at Abuja are achieved continues. WHO advocates a pluralistic approach with emphasis placed on developing commercial distribution systems with subsidies targeted at those who are unable to afford nets at commercial prices (WHO, 2002). On the other hand there are arguments that poverty is so widespread among the rural population most at risk of malaria that other mechanisms such as free distribution of ITNs need to be explored (Guyatt et al., 2002).

2.2.2 Distribution strategies in Kenya

The main channels for distribution of bed nets in Kenya are: the NGOs, public sector and the commercial sector. The NGOs contribution to scaling up ITNs coverage in Kenya cannot be ignored as several NGOs and mission groups continue to operate community-based health service delivery programmes across the country. These communities are often disadvantaged and have poor access to formal health services (Snow et al., 1999).

a) Targeted subsidies

The RBM strategic framework for coordinated national action in scaling up ITN programmes in Africa advocates for public provision of targeted subsidies to maximise public health benefits alongside support and stimulation of the private sector (WHO, 2002). Subsidies are provided using two main modes; direct and indirect subsidy. The direct subsidy is where the beneficiary purchases or receives the bed net directly from the provider. The indirect subsidy is where the beneficiary is given a voucher which they present to the provider for them to receive the bed net. Subsidies can be provided either as a full subsidy (no cost to consumer) or a partial subsidy (discounted cost). The vouchers are then redeemed by different providers from a central body. The health
facilities (public sector) are used to deliver the partially or fully subsidized nets in many cases while in others, existing community structures (community based organizations) are used to provide a platform for net delivery (Worall et al., 2005). The objective when providing subsidies is to target those people in the community who would otherwise not afford the price of an unsubsidized ITN. An inter country review suggests that the strategy of subsidised nets has not been effective as a means of improving equity (Webster et al., 2005b). According to the review richer or less poor households have been more successful at taking advantage of the subsidised supplies.

b) Free ITNs distributed during immunization campaigns

Integration of ITNs into immunization campaigns has been done in several African countries. The method uses the public sector to deliver the bed nets together with the measles vaccine. In contrast to the low ITN coverage rates, childhood vaccination commonly reaches high coverage, particularly when vaccines are delivered through mass campaigns (Grabowsky et al., 2005). Campaigns are highly effective in reaching all children regardless of their economic status. Successful experiences of the integration of ITNs to a measles campaign are reported in Ghana, Zambia and Togo (Grobowsky et al., 2005). Compared to other methods, campaigns are relatively good at achieving both socioeconomic and geographic equity (i.e. they reach the poor and remote communities). They are however inefficient in achieving timing equity (i.e. children born shortly before a campaign enjoy far better health benefits than children born later in the inter campaign interval (Webster et al., 2005a). The potential benefit of this method of delivery has prompted recent global policy changes to encourage increased integration of ITN
delivery and vaccination (WHO-UNICEF, 2004). The problem of timing equity suggests a need for the campaign to be done annually instead of once every three years as is the case presently.

c) Social marketing

Social marketing refers to the application of commercial marketing methods for a health gain and without a profit motive. It offers a way of increasing demand through promotion at the same time supplying bed nets at a subsidized price (Nathan et al., 2004). Social marketing has been used extensively in Tanzania and Malawi and it has proved a major success in attempting to scale up coverage with ITNs in Africa (Heidi, 2006). The argument advanced in favour of social marketing is that sustained donor funding to provide free ITNs cannot be relied upon. It is therefore considered preferable to use existing donor funding to encourage households to become accustomed to spending their money to buy bed nets and insecticides (Maxwell et al., 2006). On the other hand attempting to market nets to the very poor people requires much effort and expenditure for promotion however experience shows that villagers are well aware of the ITNs and their benefits, the problem is finding money to pay for the ITNs (Maxwell et al., 2006).

d) Free delivery of bed nets for the poor

ITNs are a public health good by any measure. In order to accelerate delivery of ITNs to the vulnerable groups, WHO and UNICEF strongly encourage that ITNs should be distributed freely together with other public health interventions targeting them (WHO-
UNICEF 2004). ITNs are of comparable cost effectiveness to Expanded Program on Immunization (EPI) vaccinations and hence should be delivered in the same way: free of charge through the public sector (Curtis et al., 2003).

There have been arguments for and against free ITN distribution. The group in favour of free distribution of ITNs supports their argument by the evidence from a few East African pilot projects regarding the feasibility of such an approach, the existence of a significant community effect in most areas with high ITN coverage, the reality of a high proportion of the rural populations in Sub-Saharan Africa (SSA) being unable to pay for such an intervention, and the hope that rich countries would be willing to pay for malaria control in SSA (Curtis et al., 2003). However, the group not in favour of free distribution and favouring strengthening of commercial markets supports their argument with promising experiences from a large ITN social marketing programme in rural Tanzania, the important role of market involvement in the success of ITN programmes in Asia, the assumption that universal coverage with free ITN would destroy local commercial markets and the uncertainty of continuous availability of foreign funds for ITN programmes.

e) Commercial retail market for bed nets in Kenya

The commercial sector’s role in provision of bed nets in Kenya cannot be ignored. An audit of twenty towns around Kenya in 2002 revealed that twenty one different brands of bed nets exist and they are available in different prices and sizes. The nets available through the commercial sector range from pre-treated nets, untreated nets to nets
packaged together with a treatment kit (Larson and Rosen, 2002). The observation that most of the nets used by children under the age of five are untreated and from retail outlets is a pointer on the importance of this channel of delivery in the scaling up campaigns (Webster et al., 2005). On average the price for an unsubsidized net in Kenya is 320 Kenya shillings (Larson and Rosen, 2002).

Amid calls for increased funding for infectious disease from the Commission for Macroeconomics and Health and the creation of the Global Fund for AIDS, TB and Malaria, there has been high profile advocacy and debate about how to increase availability and uptake of effective malaria control interventions (Médecins Sans Frontières, 2003). Much of this debate focusses on the appropriate roles for the public and private sectors in financing and delivery of malaria control interventions.
CHAPTER THREE: MATERIALS AND METHODS

3.1 Research design
This was a descriptive cross sectional study that made use of multi method approaches. This study followed a wider study that explored access to malaria treatment and prevention among the poor in four districts. The thesis demonstrates the extent to which different strategies are effective at reaching the people vulnerable to malaria and specifically the poor. To answer the research question, primary data arising from key informant interviews carried out with the suppliers of bed nets and secondary data arising from annex post facto research of two cross sectional surveys carried out in the wider study were analysed. In the ex post facto research; the study was undertaken after a free mass distribution of bed nets had occurred. The distribution of bed nets was independent and the study just researched aspects in the community without manipulating anything. The secondary data was captured from the ex post facto research. It captured information about the mass distribution of bed nets by the government. The mass distribution of bed nets is an exercise where the government issued out free bed nets to the children aged below five years. The program was integrated with the measles vaccination campaign. The first survey was done before the mass distribution of nets and the second survey was done eight to ten months after the mass distribution of bed nets. Data from these surveys help to estimate the change in bed net ownership as a result of the mass distribution. The period before the mass distribution represent a time when the strategies of distribution being used were mainly the commercial sale of nets and the social marketing of subsidized nets.
3.2 Variables
There were two main variables considered in the study. The independent variable was the bed net distribution strategy and the household social economic status while the dependant variable was the household ownership of bed nets. The household social economic status was measured using the Principal Component Analysis (PCA) as explained by Vyas and Kumaranayake, 2006. Using this method the households’ ownership of different assets was used to classify the households into three different social economic groupings. These were; low social economic status, medium Social economic status and high social economic status. The measurement of the social economic status is described in more detail in the data analysis section i.e. 3.11. A bed net strategy was taken to be the method used to get the net to the household. Three main distribution strategies were identified; free distribution, subsidized sale and commercial sale of nets.

The dependant variable was reaching of a household with a bed net. This was measured by physically checking and confirming the household’s possession of a bed net from a particular source.

3.3 Location of the study
The study was carried out in Kwale District and Makueni District in Kenya. The two districts were purposively chosen because they represent two different, malaria transmission patterns. Kwale being classified among the malaria endemic zones with stable malaria transmission and Makueni is classified in the seasonal malaria transmission zones with times in the year when we have high reported cases of malaria and other times when transmission is low. The two districts have in addition been part of the intervention districts for the DOMC in Kenya. This choice was also dictated by the
areas where the wider study had taken part. A map of the two districts is provided in the appendix 1.

3.3 Target population
The target population was the distributors and the users of bed nets in Makueni and Kwale districts in Kenya.

3.4 Study population
The study population consisted of the shop keepers/shop owners, NGO managers for organizations dealing with ITNs, those in charge of health facilities and the sampled household heads (who are the users of bed nets) in the study districts.

3.6 Sampling Techniques and sample size
3.6.1 Sampling technique
Purposive sampling was used to select bed net distributors to participate in the study. Sampling was started at the district level and snowballing was used to identify the different distributors. Care was taken to ensure that the sampled distributors belonged to different divisions’ representative of the district; three divisions out of six divisions in Kwale and nine out of eighteen divisions in Makueni. Those distributors falling closest to where the wider study was taking place were preferred and sampled. The sampling unit for the users was the household.

3.6.2 Sample size
To calculate the number of households to be interviewed in the cross sectional surveys the formula \( n = \frac{z^2pq}{e^2} \) for sample size calculation as explained by Kothari (2003) was used. \( n \) is the number of units to be sampled, \( z \) is the confidence interval at 95%, \( p \) is the positive value taken as 15% coverage in Kenya (Noor et al., 2006), \( q \) is 1-p and \( e \) is the
desired precision which is 0.04 for this study. When this numbers were substituted into the formulae a sample of 306 households was calculated. This number was proportionately allocated to the two districts depending on the level of utilization of ITNs in the two districts. ITN utilization in Kwale is 18.5% while in Makueni it is 11.3% (Guyatt et al., 2004).

**Table 3.1 Breakdown of the Proportionate allocation of the calculated sample**

<table>
<thead>
<tr>
<th></th>
<th>Kwale</th>
<th>Makueni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Sample (Proportionately allocated to the districts)</td>
<td>190</td>
<td>116</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Survey (No. questionnaires analysed)</td>
<td>184</td>
<td>141</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Survey (No. questionnaires analysed)</td>
<td>167</td>
<td>125</td>
</tr>
</tbody>
</table>

The sample for the qualitative work was obtained using theoretic sampling (Marshall 1996). In theoretic sampling data collection continues up to a point where the researcher experiences information redundancy. This point was recognized through the use of daily summaries and when no new information was forth coming. A total of 32 health facilities (14 Kwale and 18 Makueni), 11 NGOs (5 Kwale and 6 Makueni) and 27 retail outlets (12 Kwale and 15 Makueni) were visited.

### 3.7 Construction of research instruments

Various tools were used to collect data from the target groups. Four structured questionnaires were prepared for the purpose of collecting data. To construct the questionnaires the researcher first came up with a draft of questions that would provide answers to the study objectives. Information obtained from literature review and informal
interviews with the distributors aided in drafting this questions. In addition questionnaires used in previous studies that had close or similar objectives were studied and this assisted in formulation of the questionnaires. Finally the study supervisors assisted the researcher in refining and coming up with the final questionnaires that have been used in this study. Samples of the various questionnaires used in collecting data for this study are attached as appendices 3.

3.8 Pilot study
A pilot study was conducted in Kilifi District. The aim of the pilot was to test the reliability and validity of the research instruments. Kilifi District presented similar conditions to those expected in the study area. The District was also chosen because it was convenient for the researcher, in terms of geographical location because it was the resident district for the researcher. Results from the pilot study resulted in appropriate revision of the tools and questions that were not clear or those incorrectly phrased were revised or removed from the tool.

3.8.1 Validity
Validity of the study instruments was ensured by having a representative sample calculated according to the formulae provided for in literature and through triangulation of the methods. Internal validity was also ensured using the test – retest method.

3.8.2 Reliability
The researcher did the pilot under the mentorship and guidance of the supervisors. The construction of the research instrument was very exhaustive to ensure that the instruments collected what they are meant to collect.
3.9 Data collection techniques
The data collection exercise was undertaken between March 28th 2008 –June 15th 2008. This took approximately two months in both districts. The entry point for the researcher was the districts head quarters in both Kwale and Makueni. Letters of introduction were sent to the District administrators and to the District Medical Officer of Health (DMOH) in advance. Prior to visiting any facility, efforts to contact the providers in person or by phone were made and interviews were booked before the actual days for the interviews. The researcher carried out the interviews personally except for the retail outlets in Makueni where the use of a field worker was necessary due to language barrier. Daily summaries were done and based on this, next interviews were planned and improvements were made on the interviewing process. The daily summaries also aided recognition of the information redundancy stage for the sake of sample size determination. The semi-structured survey questionnaire was administered by field workers recruited from the community.

3.10 Logistical and Ethical consideration
Ethical clearance for this study was obtained from the Kenya Medical Research Institute (KEMRI) National Ethical Review Committee. Further clearance to do research was given by Kenyatta University. During the research verbal informed consent was sought from all participants. Confidentiality of all individual level and institution level information was assured during and after the research by keeping all the research information confidential. At no time were the names or the true identities of the respondents revealed.
3.11 Data Analysis
The quantitative data were sorted, cleaned and entered into Microsoft Visual FoxPro version 6.0 computer software. The data were then transferred to STATA version 9.2 for analysis. Principal Component Analysis (PCA) was used to generate the Social Economic Status (SES) index. This was then used to classify the household in the two districts into three quintiles depicting different levels of SES. Household ownership of different assets aided in the SES clustering (Vyas and Kumaranayake, 2006). Due to the fact that different assets have different social and economic value in each district the PCA was done separately. Mean asset scores were then created for each household and this aided in classification of the households into three different groups based on their economic status. Asset indicators were used to derive the SES index because unlike the income and expenditure measurements, asset indicators are not faced with the limitations of recall bias, seasonality and data collection time (Vyas and Kumaranayake, 2006). Descriptive statistics were used to analyze the quantitative data. Pearson’s chi square test for independence and trend were used to test for association between variables. Differences between proportions were analyzed using the Chi Square test for proportions.

The qualitative data were analyzed drawing heavily on the thematic framework approach (Ritchie and Spencer, 1994). The first step involved familiarization with the data. This involved thoroughly reading the interview transcripts to understand the findings from the study. The next step was construction of a thematic framework; this was informed by the familiarization phase and the themes arising from the data were used to construct the thematic framework. Care was taken to ensure that the sources for the different themes were marked and identifiable. Finally charting and interpretation of the findings was done. The qualitative data is presented using different themes quotes and summary tables.
CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Characteristics of the study population
Table 4.1 shows the age distribution of household members in sampled households. A total of 325 and 297 households in both Kwale and Makueni Districts were included for analysis from the first and second cross sectional survey respectively. In the first cross sectional survey held before the distribution of the free nets the household members aged above 18 years were 419 (45%) in Makueni and 505 (38%) in Kwale. The males made up 504 (54%) and 638 (48%) of the sample population in Kwale and Makueni respectively.

In the second survey held after the free net distribution household members above 18 years were 365 (44%) and 473 (38%) respectively for Makueni and Kwale. The males were 439 (53%) and 584 (47%) in Makueni and Kwale Districts respectively.

Table 4.1: Breakdown of sampled population (cross sectional survey)

<table>
<thead>
<tr>
<th></th>
<th>1st Survey</th>
<th>2nd Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kwale</td>
<td>Makueni</td>
</tr>
<tr>
<td>Households (N)</td>
<td>184</td>
<td>141</td>
</tr>
<tr>
<td>No. of people</td>
<td>1329</td>
<td>933</td>
</tr>
<tr>
<td>Gender</td>
<td>Male 54%</td>
<td>Male 48%</td>
</tr>
<tr>
<td>Age distribution of household members in sampled households</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5 Years</td>
<td>253 (19%)</td>
<td>140 (15%)</td>
</tr>
<tr>
<td>5-18 Years</td>
<td>571 (43%)</td>
<td>383 (40%)</td>
</tr>
<tr>
<td>19 - 35 Years</td>
<td>266 (20%)</td>
<td>205 (22%)</td>
</tr>
<tr>
<td>36 - 50 Years</td>
<td>106 (8%)</td>
<td>75 (8%)</td>
</tr>
<tr>
<td>50 + Years</td>
<td>133 (10%)</td>
<td>140 (15%)</td>
</tr>
</tbody>
</table>
4.1.1 Education level and income sources

The Fig 4.1 shows the highest education levels for the adults in the districts. Education level and source of income were important to this study because they can be used as an indirect indicator to income levels in the community. 47% of adults in Kwale and 18% in Makueni district had never attended school. The number of adults that had never attended school in Kwale district is significantly higher than that in Makueni (Z= 9.36, P = 0.0000). 41% and 56% of adults in Kwale and Makueni respectively had attained only primary education. This could be because Kwale being a highly Muslim society the residents put more emphasis on religious education than secular education. The main source of income in the two districts was subsistence farming (53% Makueni and 66% Kwale). Some of the sources of income were casual labour (11% and 13.3%); trade (8% and 8.4%); and civil servants (0.6% and 2%) for Kwale and Makueni respectively.

![Adult highest education levels](image)

**Fig 4.1** Bar graph showing the level of education among the adults
Bed net ownership and use in the study community

4.2.1 Effect of mass distribution strategy

Net ownership

Table 4.2 illustrates the change in net ownership after the mass distribution for the two districts. There was a significant increase in the proportion of households that owned at least one net of any kind in both districts after the mass distribution (Kwale 48% to 74% P > 0.00 and Makueni 54% to 82% P > 0.00). However there was no significant change in the mean number of nets per households after the mass distribution compared to the period before the mass distribution.

![Net ownership graph](image)

**Fig 4.2 Bar graph illustrating the Change in household net ownership after the mass distribution**

Net usage

Figure 4.3 illustrates the increase in net usage among key vulnerable groups after the mass distribution. After the free mass distribution of bed nets, there was an increase in
the number of children aged five years sleeping under a net compared to the period before the mass bed net distribution exercise (Makueni 383 (46%) to 613 (74%) and Kwale 492 (37%) to 610 (49%)). There was also an increase in the number of women of reproductive age sleeping under a net after the mass distribution compared to the period before the mass distribution of nets (Makueni 156 (38%) to 220 (60%) and Kwale 137 (28%) to 193 (425%). Statistical analysis of this result indicated a significant increase in the number of children aged below five years who had slept under a net the night before the survey (Makueni 46% to 74% P= 0.0000 and Kwale 37% to 49% P= 0.005). There was also a significant increase in the number of women aged between 18 and 35 years who had slept under a net the night before the survey after the mass distribution (Makueni 38% to 60% P> 0.0000 and Kwale 28% to 42% P> 0.0102).
Fig 4.3 Bar graph comparing net usage among key vulnerable groups after the mass distribution

4.3 Sources of bed nets in the household

Dispensaries and health centres were the most mentioned nearest source of bed nets for the household in the two districts (101 (55%) Kwale and 58 (41%) Makueni) as illustrated in Fig 4.4. Other sources for bed nets in Makueni were 39 (28%) Local markets, 37 (26%) government hospital and 7 (5%) NGO and Local CBOs. In Kwale District the other sources mentioned are 41 (22%) local markets or shops, 31 (17%) NGOs and 11 (6%) the district hospital.

The main sources for the mass distributed nets in both districts were dispensaries and health centers (138(75%) and 65 (46%) Kwale and Makueni respectively). Other sources included; district hospital and non-governmental organizations. The number of nets reported to have been received in the mass distribution ranged from one to three nets per household. The majority of households received a single net (134 (73%) Kwale and 76 (55%) Makueni).
4.4 Reasons for failure to own a net
The households that did not have nets before the mass distribution reported nets being expensive as the main reason why they did not own nets (106 (75%) Makueni and 160 (87%) Kwale). Other reasons mentioned included: (Makueni 24 (17%) nets not being necessary and 11 (8%) nets not being available, in Kwale 15 (8%) ineligibility for the nets and 9 (5%) dislike for the nets. The reasons for failure to receive a net during the mass distribution were: household being ineligible to receive the net (101 (55%) Kwale and 54 (39%) Makueni) and nets being too few (61 (33%) Kwale and 59 (42%) Makueni). Other reasons that were mentioned in two districts included place of issue being too far (Makueni 20 (12%) and Kwale 7 (4%) and hearing about the free nets too late (Kwale 15 (8%) and Makueni 10 (7%)).
4.5 User’s perception of the best distribution method to reach the majority of households

4.5.1 Best distribution method for bed nets
More than three quarters of the household representatives interviewed said that the best method of distributing nets to ensure they reach the majority is giving them free to all households without limitations, 166 (90%) and 104 (74%) in Kwale and Makueni respectively. Less than a quarter of those interviewed said the nets should be given free to all children below five years and sold to adults at a subsidized fee, 34 (24%) and 18 (10%) in Makueni and Kwale respectively. Only 3 (2%) of respondents in makueni district alone said that nets should be sold at a subsidized fee to all in the community. The majority of users in both districts favoured the distribution or sale of nets through the health facility (78% and 84% of users in Makueni and Kwale respectively). The reason mentioned for this was similar in both districts i.e. the health facilities are many and found evenly distributed in the district.

4.5.2 Availability of bed nets
Asked to rate the availability of the bed nets in the community, the majority of users in both districts said the nets were rarely available 147 (80%) in Kwale and 102 (72%) in Makueni. The remaining 39 (28%) and 37 (20%) in makueni and kwale respectively said the commercially sold nets were not available

4.5.3 Acceptability of bed nets
More than half of the respondents said they agree with the use of bed nets as a way of controlling Malaria Makueni 121 (86%) and Kwale 142 (77%). The remaining 42 (23%) in Kwale and 20 (14%) in Makueni did not agree with the use of bed nets for control of
Malaria. When this is compared statistically with the ownership of nets as a proxy for access to the nets, the results indicate a significant relationship between acceptability and ownership of a bed net ($\chi^2=8.94$, df =1, P < 0.001).

### 4.5.4 Affordability of bed nets

Asked if the respondent could afford to buy a bed nets, slightly over a half of the respondents in Makueni and well below a quarter of the respondents in Kwale said they could afford to purchase a bed net 76 (54%) Makueni and 31 (17%) in kwale. Statistical analyses of the results showed a significant relationship between ownership of bed nets and affordability of a bed net ($\chi^2=6.24$, df =1, P < 0.010).

### 4.6 Access to bed nets across different socio-economic groups

#### 4.6.1 Bed net ownership across different socio-economic groups

Before the mass distribution, 46 (15%), 131 (42%) and 129 (43%) people belonging to low, medium and high SES groups in Makueni District owned at least one net. In Kwale district there were 77 (17%), 102 (22%) and 153 (38%) people belonging to the Low, medium and High SES groups owning at least one net. Statistically there was significant association between household ownership of at least one net and the household SES in both districts (Makueni $\chi^2 = 28.00$, P < 0.0000 and Kwale $\chi^2 = 12.03$, P< 0.0024). After the mass distribution there was a marked increase in bed net ownership in different SES groups in both districts. Kwale district never the less still showed a significant association between household ownership of bed nets and SES ($\chi^2 = 6.4$, df =2, P= 0.025). There was no significant association between net ownership and household SES in Makueni district ($\chi^2 = 3.99$, df=2 P >0.13). The relationship between SES and ownership of nets in Kwale and not Makueni could be as a result of the free nets having been readily accepted in
Makueni more than in Kwale. The study results also showed no significant association between household failure to receive a free net and household SES in both districts (kwale $\chi^2 = 1.31$, df=2 $P > 0.52$, Makueni $\chi^2 = 0.27$, df=2 $P > 0.87$).

![Bed net ownership before mass distribution](image)

**Fig 4.6** Bar graph comparing bed net ownership by socio-Economic status

4.7 Provider perspectives on bed net distribution

4.7.1 Distribution strategies
Table 4.2 summarizes the distribution strategies and type of bed nets available in the districts. All the distributors interviewed (health workers, NGO workers and shop retailers) mentioned there distribution strategies for bed nets in the study Districts: Free distribution, subsidized distribution and commercial distribution.
### Table 4.2  Bed net distribution strategies

<table>
<thead>
<tr>
<th>Distribution method</th>
<th>Institution offering</th>
<th>Suppliers Kwale</th>
<th>Suppliers Makueni</th>
<th>Brand</th>
<th>Type of net</th>
<th>Shape</th>
<th>Color</th>
<th>Price</th>
<th>Target group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Free Net</strong></td>
<td>Health facilities</td>
<td>MOH, Red Cross, Plan int etc</td>
<td>District Hosp.</td>
<td>Olyset, Permanet</td>
<td>LLITN LLITN</td>
<td>Rectangle</td>
<td>White</td>
<td>Nil</td>
<td>ANC women U5yr olds</td>
</tr>
<tr>
<td></td>
<td>NGOs</td>
<td>NGO HQs</td>
<td>NGO HQS</td>
<td>Olyset</td>
<td>LLITN</td>
<td>Rectangle</td>
<td>Blue</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBOs</td>
<td>Partnering NGO</td>
<td>Partnering NGOs</td>
<td>Branded supanet</td>
<td>UTN untreated with pack</td>
<td>Rectangle</td>
<td>white</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subsidized net</strong></td>
<td>Health facilities</td>
<td>PSI, MOH, DANIDA, NGOs</td>
<td>District Hosp.</td>
<td>Olyset, Permanet</td>
<td>LLITN LLITN</td>
<td>Rectangle</td>
<td>Blue</td>
<td>50/=</td>
<td>U5yr olds ANC women</td>
</tr>
<tr>
<td></td>
<td>CBOs</td>
<td>Partnering NGO</td>
<td>NGO HQS</td>
<td>Olyset</td>
<td>LLITN</td>
<td>Rectangle</td>
<td>Green</td>
<td>20/= to 200/=</td>
<td>No special target</td>
</tr>
<tr>
<td></td>
<td>Retail outlet</td>
<td>PSI</td>
<td>PSI</td>
<td>Branded supanet</td>
<td>UTN untreated with pack</td>
<td>Rectangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commercial nets</strong></td>
<td>Retail outlets</td>
<td>Wholesale market</td>
<td>Wholesale market</td>
<td>Various Kibao, Netmark, supanet</td>
<td>UTN untreated with pack</td>
<td>Round</td>
<td>Blue white</td>
<td>300/= to 450/=</td>
<td>No special target</td>
</tr>
<tr>
<td></td>
<td>CBOs</td>
<td>Partnering NGO</td>
<td>Partnering NGO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.7.2 Operation of the distribution strategies

i. Target group identification

The groups targeted through the subsidized distribution and the free distribution strategies are the children aged below five years and the pregnant women. All the health workers interviewed said that they use the clinic cards to identify their target group. Use of clinic cards is however not exclusive because 20% of the health workers in Makueni and a further 32% in Kwale district added that in some instances they use personal expertise or experience to identify who is aged below five years or pregnant.

An example of such incidence is illustrated by the quote below;

“From experience we can tell the under fives at the clinic and the pregnant women without necessarily looking at the cards. The cards are not a must.” (Kw NGO 01/07 28/05/07, Nurse)

Of all the health workers interviewed 13 (90%) and 15 (85%) in Makueni and Kwale respectively reported having sold nets to none targeted groups.

<table>
<thead>
<tr>
<th>Reasons for selling subsidized nets to non targeted groups according to health facility in charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>People cannot afford unsubsidized nets because of high levels of poverty</td>
</tr>
<tr>
<td>Targeted groups already have the nets hence low sales</td>
</tr>
<tr>
<td>People not eligible to be targeted force distributors to sell to them</td>
</tr>
<tr>
<td>Perception that everyone suffers from malaria and hence no reason to leave out some people</td>
</tr>
<tr>
<td>Nets are taken as an income generating commodity and if they are not sold they just tie down the health facility resources. The need to make profit from the net results in sales to non targets</td>
</tr>
</tbody>
</table>
Some of these reasons are illustrated in the following quotes by various providers.

“We sell to everyone [PSI 50 shilling net] because everyone suffers from malaria. They deserve the net.” (Kw08/0,725/05/07, Nurse)

“They buy from the dispensary the 50 shilling net. These nets even though initially had those rules of only being sold to the under fives and the pregnant women, now they have been opened up to all other people because the dispensary health committee also wants to make money and again people complain so much that they also want the nets. When the nets were targeted only for the under fives the community mis-trusted the motive behind this and the nets had to be sold to others in the community to prove that there was no ill motive in targeting the small children.” (Kw NGO 05/07, 28/05/07, community health worker)

ii. Efforts to reach the poor

All the 11 NGO project personnel interviewed reported that they deal with the poor. Slightly over a third of those interviewed 4 (36%) said that their location in the poor districts of Makueni and Kwale was in an effort to reach the poor. Slightly over a third of the total health personnel interviewed 12 (34%) and all the NGO project officers interviewed 11 (100%) in both districts reported that the strategies they were using to reach the poor included: allowing for credit, health education, selling of nets to ineligible individuals and waiving the fee of the nets. Identification of the poor is however not very well defined and is rarely done therefore in some instances the poor may not actually benefit from a waiver:

“Sometimes we waive for some people, for example if we see a very sick child or a mother who is very poor we waive the fee. We do assessment first though on very few occasions.” (Mk15/0719/06/07, Nurse)
Unlike in Makueni District a small number of health workers in Kwale District 3 (21%) allowed for instalment purchase of the subsidized bed nets. This encouraged those who may not be able to pay the full price at once to have access to the nets. Of all the health personnel interviewed at 32 health facilities 21 (66%) reported that their facilities did not have any specific program for reaching the poor especially after 100 shillings net had stopped being brought to the facilities. Lack of a program to reach the poor is echoed in the following quotes:

“Initially we had the 100 shillings nets which they [the poor] use to buy but currently unless they go to Wote [a town] to buy the nets they cannot buy from here.” (Mk 15/07) 19/06/07, Nurse)

Of the 27 retailers talked to 25 (95%) did not undertake any extra efforts to reach the poor customers with the bed nets. Credit was mainly given to those people who are known to the shopkeeper or who have ability to pay suggesting little help to the poor.

“Familiar faces [People who are known to the shop keeper] take nets on credit while unfamiliar faces have to pay in small instalments until they pay the full price before taking the net home. Credit depends on character and the economic status of individual. Those who cannot pay do not get nets on credit.” (KwRo12/07) 30/05/07, shop owner)

4.8 Challenges in distribution

Table 4.4 presents a summary of the different challenges that are faced by each of the distribution strategies. These include: supplier related challenges, logistical, regulatory limitations, market competition and organizational limitations. In discussing the challenges to the distribution of bed nets, the challenges that are common to the distribution strategy are presented first and then those challenges that are specific to a particular distribution strategy are presented.
4.8.1 Supplier related challenges

Table 4.4 Supplier related challenges to distribution

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Social marketed (health facility)</th>
<th>Social marketed (NGO)</th>
<th>Free</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier related challenges</td>
<td>• Cost</td>
<td>• Delivery time</td>
<td>• Time of delivery</td>
<td>• Cost of supply</td>
</tr>
<tr>
<td></td>
<td>• Access</td>
<td>• Access</td>
<td>• Frequency of delivery</td>
<td>• Access to supplier</td>
</tr>
<tr>
<td></td>
<td>• Delivery of nets to facility</td>
<td>• Sustainability</td>
<td>• Quantity delivered</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustainability</td>
<td>• cost</td>
<td>• sustainability</td>
<td></td>
</tr>
</tbody>
</table>

i. Cost of supply

The majority of bed net distributors said the cost of bed nets was relatively high (26 (81%) of all health personnel and all 27 retail outlets interviewed. The high cost of the bed nets has resulted in frequent cases of stock outs. For 8 (25%) facilities that did not receive support to start the sale of bed nets, the health personnel interviewed said they found it difficult to pay for the first order. Cost as a limitation was more pronounced facilities that dealt in the nets costing 100 shillings that require a large capital to stock. These nets are targeted at people who are not eligible for the 50 shillings net (50 shillings net is targeted to the women attending ANC and children aged below five years). The problem of cost can be felt in some sentiments like:

“Getting money to buy the nets is a problem because we depend on the meagre amount collected through the charges at the health facility.” (Mk13/07), 18/06/07

Facility in charge)

“The price of the nets is very high, we cannot afford to stock more and people cannot afford to buy this once (commercial) when they know cheap nets are there.”

(KwRo/06/07, 22/05/07 shop owner)
ii. **Market competition**

Interviews with health care providers revealed that there are two prices for nets in the facilities. All the health facility providers said that community members are reluctant to buy the 100 shillings net that is untreated. They instead preferred the long lasting treated net that is available at the health facility at a much cheaper price (50 shillings). This presented a situation where there was product competition and rivalry. This competition has meant that the facility that stock the 100 shillings net have their capital being tied down by an unmoving product.

“The price of 100 is what makes them (nets) not to be bought much because people do not have money and they know there is a net for 50 shillings.” (Kw12/07 23/05/07 Facility administrative assistant)

iii. **Access to supplier**

Inability to access the supplier was a problem for 27 (84%) of the health facility providers interviewed. At the time of the interviews 12 (50%) and 7 (37%) of health facilities in Makueni and Kwale respectively did not have a stock of nets because they were waiting for the supplier to deliver. The stock out period ranged from six weeks to a year. Communication with the supplier is often hard and expensive. All the 27 retail outlets in both districts reported that they had to travel long distances to reach the manufactures or wholesalers when were often located in major towns or even in another district. In addition, Poor road network results in extra costs for distribution and delayed delivery of the bed nets especially in the rainy season.

“We usually contact the supplier when the nets are over but he does not come immediately, it may take even months. We may go to the district hospital but the district hospital does not transport for us.” (Mk10/07, 22/06/07 Facility in charge)
iv. **Sustainability of supply**

Sustainability of the supply was a problem across all the strategies. Of those interviewed 13 (42%) of health care providers, all the 11 NGO personnel and 10 (38%) of the retail outlet owners said they were not sure if a supplier would keep delivering nets or not. NGO providers explained that their delivery of bed nets to any facility or community was dependant on the length of the program in the area and budget allocation for the program.

“DANIDA also helped us by buying for us the nets at 30 shillings and selling them to us at 15 shillings [this price is cheaper than the usual price of acquiring the net]. This helped us to generate money for the Dispensary Health Committee (DHC). The program was done through the district hospital but it only came twice. The program came to an end without explanation; we can not access the nets again.” (Kw06/07, 21/05/07 Nurse in charge)

4.8.2 **Logistical limitations**

Table 4.5 **Logistical related challenges to distribution**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Social marketed (health facility)</th>
<th>Social marketed (NGO)</th>
<th>Free</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistical limitations</td>
<td>• Distance</td>
<td>• Distance</td>
<td>• Transport</td>
<td>• Distance</td>
</tr>
<tr>
<td></td>
<td>• Transport</td>
<td>• Poor planning</td>
<td>• Manpower problems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Number of staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Poor planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Manpower problems</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

i. **Distance**

Distance to the point of distribution for the nets was a challenge mainly for the health facility providers. All the 32 health facility providers said they carry out outreach activities to areas that are approximately 20 kilometres from health facilities so as to reach a majority. Well over three quarters of the health providers 28 (87%) reported
that they use a motorcycle to undertake the outreach activities. In addition, distance to the point of restocking was a challenge for health providers especially when the supplier did not deliver the nets to the facility or end distributor directly

“The distance to the outreach is so far and we travel with a motorcycle hence can not carry so many nets”. (Kw10/07, 18/05/07 Nurse)

ii. Poor planning

The interviews revealed that 19 (60%) of the health facility distributors lack clear instructions on targeted groups and reasons for such targeting. Before the free distributions all the providers (both NGO and health facility) reported having received some instructions from different sources on how to distribute the nets. The instructions according to the health facility providers were not clear and it led to confusion in the implementation of the free bed net distribution program. All health facilities providers and NGO staff said they lacked adequate manpower to carry out the distribution exercise. The study established that across the different distribution strategies there was no strategy that had a work force exclusively working on the bed nets program. In most cases distribution or sale of the bed nets was just an added task for the worker who had other duties like nursing, laboratory technologist, CHW, retail sales person, clinical officer and facility clerk.

4.8.3 Regulatory limitations

4.6 Regulatory related challenges to distribution

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Social marketed (health facility)</th>
<th>Social marketed (NGO)</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory limitations</td>
<td>• Cumbersome procedural regulations</td>
<td>• Varied objectives</td>
<td>• Government limitations and policy</td>
</tr>
</tbody>
</table>
i. Program rules and regulations

In-depth interviews with the program managers at the ministry of health and the NGOs revealed that the subsidized net available to the facilities can only be sold to a specific targets and the 100 shilling green net was only available to health facilities or CBOs that are situated more than five kilometres away from tarmac road. The health facility and NGO providers must follow these regulations in order to keep receiving the subsidized nets for sale. The providers interviewed (23 (72%) health facility and all NGOS) viewed these rules as a limitation to sales and their ability to increase bed nets coverage in the districts. The providers felt that the communities where they are working are genuinely poor and require a subsidy hence the rules are a limitation to their work.

4.9 Provider perspectives on factors affecting community access to bed nets

Table 4.7 gives a summary of the factors that are responsible for limiting community access to the bed nets. The challenges to distribution discussed in section 4.4.3 also limit community access to bed nets. This section highlights the factors affecting access. Affordability, availability, geographic location, consumer preference (acceptability) and awareness are all factors that affect access.
Table 4.7 Factors affecting community access to the bed nets

<table>
<thead>
<tr>
<th>Strategy Theme</th>
<th>Subsidized Health facility</th>
<th>Subsidized NGO</th>
<th>Free</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordability</td>
<td>• Poverty</td>
<td>• Poverty</td>
<td></td>
<td>• Poverty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Cost too high</td>
</tr>
<tr>
<td>Availability</td>
<td>• Few outlets</td>
<td>• Stock outs</td>
<td>• Quantity not sufficient</td>
<td>• Few outlets selling nets</td>
</tr>
<tr>
<td></td>
<td>• Stock outs</td>
<td>• Few outlets</td>
<td>• Frequency of delivery</td>
<td>• Selling nets</td>
</tr>
<tr>
<td></td>
<td>• Leakage to other groups</td>
<td></td>
<td>• Dishonest staff</td>
<td>• Stock outs</td>
</tr>
<tr>
<td>Geographic location</td>
<td>• Distribution points</td>
<td>• Distribution points</td>
<td>• Distribution points</td>
<td>• Location of retail outlets</td>
</tr>
<tr>
<td></td>
<td>• Distributors used</td>
<td></td>
<td>• Distributors used</td>
<td></td>
</tr>
<tr>
<td>Consumer preference</td>
<td>• Type of net</td>
<td>• Type of net</td>
<td>• Type of net</td>
<td>• Type of net</td>
</tr>
<tr>
<td></td>
<td>• Mode of distribution</td>
<td>• Mode of distribution</td>
<td>• Mode of distribution</td>
<td>• Love of free things</td>
</tr>
<tr>
<td></td>
<td>• Low acceptance for bed nets</td>
<td>• Low acceptance for bed nets</td>
<td>• Rumors</td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>• Limited information about net usage</td>
<td>• Limited information about bed net usage</td>
<td>• Limited information about usage</td>
<td>• Limited informatio n about usage</td>
</tr>
<tr>
<td></td>
<td>• Lack of information on where to get the nets</td>
<td>• Lack of information about where nets are available</td>
<td>• Deliberate misuse</td>
<td>• Lack of informatio n on where to get the nets</td>
</tr>
<tr>
<td></td>
<td>• Low literacy levels</td>
<td>• Low literacy levels</td>
<td>• Communication failure</td>
<td>• Low literacy levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Low literacy levels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Ignorance</td>
<td></td>
</tr>
</tbody>
</table>

i. Affordability

All the 32 health facility providers and 11 NGO personnel interviewed said that the social marketed subsidized nets sold through the health facilities and NGOs had improved affordability because of their price low. Nevertheless they acknowledged that these prices may still be unreachable for some families who lack a steady flow of income. This is supported by results of the cross sectional survey that show that the
majority of adults in the two districts are subsistence farmers (53% and 66% in Makueni and Kwale respectively).

ii. Availability

Close to three quarters of bed net distributors (13 (72%) and 9 (64%) of health facilities in Makueni and Kwale respectively and all NGO in the two districts) said that bed nets were not easily available in the districts. The restocking is done only once per year. During the study 9 (50%) and 5 (38%) of health facilities in Makueni and Kwale respectively did not have a stock of nets on the day they were visited. Except for the commercial distribution strategy all the other strategies specifically target the children aged below five years and the pregnant women with their bed nets.

iii. Geographic location

The cross sectional survey of bed users revealed that 934 (75%) and 381 (46%) of users in Kwale and Makueni respectively obtained their nets from dispensaries and the health centres. The NGO project managers interviewed said they mainly use the health facilities as their points for distribution.

iv. Consumer preferences

Interview sessions with providers from health facilities, NGOs providers and retail outlets providers established that in summary the consumer preferences from both districts are colour, shape, size and price. The blue round net at a subsidized price emerge as the most preferred by the consumers among the various providers (9 (64%) and 11 (60%) health care providers, 3 (60%) and 3 (50%) of the NGO providers and 6 (50%) and 7 (42%) of retail owners in Kwale and Makueni respectively). Despite
these valid preferences, all those interviewed (32 health facilities, 11 NGOs and 27 retail outlet providers) said that in most cases they only had one variety of nets available for sale to the consumers. All the 32 health care providers interviewed said they only stocked the blue and the green square nets. Only 2 (40%) NGOs in Kwale and 1 (17%) NGO in Makueni reported to have ever stocked the white round net. These were however not in stock at the time of the study.

“There is no room for preference because that (Blue 50 shillings net) is what is available.” [Kw14/07 on 18/05/07 facility in charge]

“Community members prefer the white colour and round which is not available among the nets we have.” [Kw09/07 on 29/05/07 public health person]

v. Illiteracy

There were low literacy levels in the communities in the study area. This results are presented in section 4.2. The low literacy was named as a challenge to good communication during health education by health care providers (6 40%) and 6 (32%) in Kwale and Makueni respectively). All the 32 health facilities provider said there was general lack of information and knowledge about bed net usage among community members.

“There is general lack of information and people do not attend the chief’s baraza so they do not get information on how to use the nets.” (Kw 06/07 on 21/5/07 Nurse incharge)
4.10 Providers opinions on ways of improving delivery of bed nets to the vulnerable groups

4.10.1 Program planning and logistics
For the subsidized and free nets to actually reach all the beneficiaries 25 (78%) of health care providers, 10 (91%) NGO personnel and 11 (41%) retail outlets owners interviewed suggested the need for redistribution of the bed nets points of sale. This would see additional sales points for different nets like shops, markets, schools, churches and it would make the nets physically available to the majority. In addition this group of respondents also felt that the target groups for the subsidized and free nets should be revised to include other vulnerable groups like the elderly, the orphans and the people living with HIV/AIDS.

Since not all health care facilities had been supported in starting up the bed nets project 8 (60%) and 6 (32%) of health facilities providers in Kwale and Makueni respectively felt that the health facilities should be supported with capital to start up bed net programs. Bed nets were an expensive project and without capital support, the health facilities were not able to begin and sustain the project.

All the 11 NGO personnel were of the opinion that for any distribution exercises, early planning and communication of what is expected in the exercise is paramount for the success of the program.

4.10.2 Commodity related improvements
Consumer preferences for the type of bed nets are varied. Most of the health providers interviewed recommended that different varieties of bed nets should be made available at various points (11 (78%) and 12 (64%) in Kwale and Makueni respectively). A reduction in price was recommended by 3 (60%) and 2 (40%) of the
NGO providers, 11 (78%) and 12 (64%) of health facility providers and all the retail outlets in Kwale and Makueni respectively.

4.10.3 Consumer related improvements
One NGO project manager in Kwale district said there was need for targeted education that would be given at specific points by a range of people on various aspects of the bed nets. The study established that while free nets were accepted 100% in Makueni in Kwale 24 (74%) of health facility providers reported that there was some mistrust around the nets and in 4 (28%) of the health facilities the nets were returned by some recipients.
CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion
The study set out to establish the distributors and user perspectives on ITN distribution strategies and whether they are reaching the poor and vulnerable to Malaria.

5.1.1 ITN distribution strategies used by different distributors
This study identified three main distribution strategies for bed nets in the communities studied: the free distribution, subsidized social marketing and the commercial distribution. These approaches are similar to those reported elsewhere and are used for distributing bed nets in countries like Tanzania, Sudan and Malawi (Chavasse et al., 1999). The three main distribution approaches make use of the 4Ps of the marketing mix: product, price, promotion and place. Some of the marketing mix attributes are similar for all the distribution strategies while others are different. The product is a bed net that comes in a variety of colour, size and quality. The price of ITNs range between zero and 650 KSH across different distribution strategies. Different methods are employed to promote the product among the users. The bed nets are made available at different places i.e. the retail outlets, the health facility, the NGO premises and at market places. Each distribution strategy employs its own mix of the 4ps of marketing and success of the strategy is measured by its ability to reach the majority of people.

5.1.2 Challenges faced by distributors as they reach the poor and the vulnerable
The study findings suggest that there is low level of literacy in the both communities studied. This in turn affects community perceptions and understanding of bed nets related issues. The demographic profile of the communities studied indicates that of the adults studied 237 (47%) and 75 (18%) have never attended school in Kwale and
Makueni districts. 202 (40%) and 243 (58%) in Kwale and Makueni have attended only primary school education. This is an indication that the education levels are very low. Considering that the majority of health facilities mentioned that they use health education as one of the methods of communicating with communities about bed nets, it is likely that understanding health messages is a challenge for people with very low levels of education. This suggests that use of the local language would be necessary in such a community to reach more people. It would be necessary to design appropriate messages for illiterate or low educated audiences about how to use the bed nets and why they should buy them.

The study results indicated that acceptability of bed nets was high in the communities studied. Statistical tests on the findings revealed that acceptability was significantly associated to access to the bed nets. There is therefore the need to start programs that increase acceptability of bed nets in the community if access is to be increased. Slightly over half of the respondents in Kwale and just above a quarter in Makueni said they could afford to purchase a bed net. With a lot of people accepting the use of bed nets for malaria control and a good number not being able to afford the bed nets, affordability comes out as important if bed net coverage in the country is to be scaled up.

The identification process for beneficiaries of the subsidized bed nets and the free nets is not very well defined. Providers use varied methods of identifying the targeted populations like clinic cards, personal expertise and observation for age. The different identification methods result in non target groups taking advantage of the subsidies. These research findings support the concerns that subsidies may be ineffective as a
means of increasing coverage among the most vulnerable because richer or people not
in the target group can sometimes be more successful at taking advantage of
subsidized supplies (Webster et al., 2005). Some providers let people outside the
target group to buy or receive bed nets meant for specific target groups. This implies
that use of total number of bed nets distributed is inaccurate as a proxy for success of
a program in reaching its target group. There is a need to harmonize the identification
process for the targeted group and to do field monitoring to ensure that the
identification process is not faulted by the providers. The source of bed nets for the
facilities and the NGOs is very limited in both districts. This study established one
major supplier for the bed nets in both Kwale and Makueni. The fact that the majority
of distributors carry out the distribution from the health facilities brings about a
barrier of access to the nets. On average the majority of health facilities serve a radius
of about 7 kilometres which means that when nets are distributed through the health
facility they are not easily accessible for the people living far away from the facility.

The study established that all the distribution strategies are faced with various
challenges in the course of distributing bed nets. There is no documented information
on the challenges faced by different distributors in the course of distribution and
findings from this study shed light on important areas for improvement. Unless the
providers are supported in their work, and unless the challenges and limitations being
faced in the distribution strategies are addressed, access to the bed nets by the people
vulnerable to malaria will be limited.

5.1.3 Reaching the poor and vulnerable groups to malaria with bed nets
The study shows that the free mass distribution resulted in a significant increase in
bed net ownership in the two districts (from 88 (48%) to 124 (74%) in Kwale and 76
(54%) to 102 (82%) in Makueni). These findings are similar to those reported elsewhere (Noor et al., 2007b, WHO 2007; Growbosky et al., 2005). Unlike in Ghana and Zambia where the increase in bed net ownership eliminated any inequalities across different SES; this study indicates that although there was a general increase in bed net ownership, in Kwale district people belonging to high SES were more likely to have benefited from the mass distribution exercise. In Makueni district however, there was no association between a household’s likelihood of owning a bed net and its SES. These results indicate that the mass distribution exercise was a success in increasing coverage with the bed nets in the society but the impact of the program amongst various SES groups was varied in different regions. There is need to ensure that distribution approaches used in different communities produce equitable distribution of the bed nets across different social economic groups.

The debate on the best strategy for distributing bed nets targeted at people vulnerable to malaria has been on for many years. While WHO has identified issuance of nets free of charge as a possible approach to ensure quick scale up of ITN ownership in the community, arguments about this method of delivery have continued. Those against free mass distribution of bed nets have fear that universal coverage with free ITNs would destroy local commercial markets (Curtis et al., 2003). This is supported by the study findings whereby the majority of retail outlets had stopped selling bed nets and retail owners described the bed nets as a very slow moving product. When commercial sector is crowded out of the bed net distribution market only the health facilities and NGOs are left distributing the bed nets. Even though the study findings indicate a near collapse of the commercial sector, the free distribution and the sale of subsidised nets through the health facilities and NGOs are not sufficient to cater for
demand of bed nets by the well off population who can afford an unsubsidized net and who are unlikely to visit the public health facilities and the NGO premises. There is a need to ensure that the commercial sector is supported to thrive and in order to cater for this population of users.

5.2 Conclusion
Three main distribution strategies were identified: free distribution, subsidized nets and commercial nets. Among the three the free mass distribution was the most successful resulting in a significant increase in household owning at least one net. In Kwale District these nets were more likely to have reached the least poor among the vulnerable groups. All the distribution strategies are faced with challenges. The lack of sustainability for and inherent problems of poor planning mean that it cannot be used in isolation to provide bed nets for the people vulnerable to malaria. In addition use of a free distribution strategy should be adopted with a lot of caution to avoid community dependency syndrome especially bearing in mind that the strategy may not be sustainable in the long run. The commercial distribution strategy is on the verge of collapse due to price competition from the highly subsidized socially marketed nets and the free nets in the community. This situation needs to be urgently redressed as a collapse of the commercial distribution will cut off many people who are vulnerable to malaria from the supply of bed nets. The subsidized nets are also not enough to serve the demand for bed nets in the community. The three distribution strategies all need to be applied together to ensure that there is a sustainable, affordable, available and acceptable supply of bed nets to the population. There is a need for a continuous evaluation of the distribution process so as to ensure that any limitations in the distribution process are dealt with to ensure increased success in the delivery process.
5.3 Recommendations
This study has identified three main distribution strategies. These strategies are facing bottlenecks as they embark on delivering the bed net to the malaria vulnerable groups. To improve effectiveness and address some of the challenges the recommendations are;

a) Decentralization of distribution
The distribution points for all the different distribution strategies should be decentralized and be placed at points that are near to the community. This will ensure that the nets are easily accessible by the majority in the community.

b) Institution monitoring for the subsidized nets
This will ensure that the subsidy is reaching the targeted population. Targeting needs to be revised to include other groups that are vulnerable like the PLWHA, the elderly, the poor and the orphans. In addition the poor in the communities should be well defined and community structures for identifying them established so that they are directly targeted for delivery of the subsidy.

c) Timely preparations for mass distribution exercise
The free mass distribution of nets has been shown to result in very significant increase in the bed net ownership in communities. There is need for intensive community education and sensitization before a free distribution exercise.

d) Consider consumer preferences
Finally Consumer preferences should be considered when making decisions on what type of nets to purchase to be made available for each distribution strategy. The study showed that consumers in different regions have specific preference for colour and shape. This should be taken into account when providing the nets for each strategy.
REFERENCES


*http://www.rbm.who.int/partnership/wg/wg_inn/docs/RBMWINStatement*


*http://www.unicef.org/health/files/UNICEFTechnicalNote5InsecticideTreatedNets.doc*


Appendix 1

MAP OF KENYA

Source: FEWS NET/USG/NDMA
Appendix 2

MAP OF MAKUENI DISTRICT

Source: FEWS NET/USG/NDMA
Appendix 3

MAP FOR KWALE DISTRICT

Source: FEWS NET/USGS/NDMA
Appendix 4

KEY INFORMANT INTERVIEW SCHEDULE (Facility in-charge; District level managers)

Code No. __________

FACT SHEET
1. Name of the organization (Specify)……………………………………
2. Date of the interview [___] [___]/[___] [___]/[___]/[___]/[___]/[___]
3. Post of the interviewee in the organization…………………………
   c) For how long have you been working with this organization? ………
   b) Role of the interviewee in the organization…………………………

ITN PROGRAM FUNCTIONING
1. What bed net related interventions is your facility involved in?
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   (Direct sale of ITNs[___] Education on use of ITNs [___] Free distribution of ITNs [___]
   Working with the community ITN projects BI[___] Indirect sale of ITNs, others [___])

   b) For how long has your organization been giving or selling bed nets in this
   community? <1 yr [___] 1-3yrs [___] >3-5yrs [___] >5yrs [___]

SPECIFICS ABOUT THE TYPE OF NETS DISTRIBUTED
3. What type of bed net is your organization dealing in? (Feel the table attached
   Overleaf)
<table>
<thead>
<tr>
<th>Brand Name (e.g., permanent, polyester)</th>
<th>Type (e.g., UTN, pre-treated, LLITN)</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Price</th>
<th>Supplier and how they access the supplier</th>
<th>How often restocked</th>
<th>How often run out of stock in last one year</th>
<th>Preference for net and reason</th>
</tr>
</thead>
</table>
b) What is your opinion on?

A. Affordability of net by community

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B. Acceptability of net by community

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C. Availability of the bed nets to community

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4. How do you store your bed nets? Are there any challenges?
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TARGET GROUP AND TARGETTING

5. What ITN programs does your program run, who does these programs target and how do you reach the target group (fill in the table provided)
(Example of targets: Mothers, children <5, pregnant women, elderly, sick people, Orphans, poor, non)
(Example of challenges: too costly, bad roads, poor turn up at public gathering, rejection of commodity by user, corruption etc)
6. **If not already mentioned**, does your organization conduct additional efforts to reach specifically the poor with bed nets?

Y/ N/ DK  [___]

If yes, explain

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b) If no, what limits your organization from specifically targeting the poor? Are there any major constraints when dealing with the poor? Explain

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**OPINION ABOUT OTHER DISTRIBUTION STRATEGIES**

7. Do you know of any organizations other than yours that have an ITN program in this area? Y [___] N [___] DK [___]

If yes, list them and type of program

1.............................................................................................................................
2.............................................................................................................................
3.............................................................................................................................

a) In your opinion, what is the contribution of these methods towards reaching the poor and vulnerable households to malaria? Explain for each method named.

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3. ..................................................................................................................  
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(Probe for effects of: Free ITNs in measles campaign and PSI activities)  
c) Do this strategies in any way either limit or support the work being done by  
your facility concerning bed nets?  
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8. In your opinion what has been the most successful strategy for getting the bed nets  
to the most vulnerable?  
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b) Suggestions or recommendations on how best to improve the delivery systems o  
reach the poor?  
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9. Can I have a look at the different type of bed nets in distribution at this facility?  

Post interview review  
Summary of interview quality: Good – Average – Poor  
Length of interview:  
..................................................................................................................  
Any questions asked that were sensitive/ disliked?  
..................................................................................................................  
Interviewee questions?
KEY INFORMANT INTERVIEW SCHEDULE (Project managers NGO; PSI - ITN manager)

Code No. _____________

FACT SHEET
4. Name of the organization (Specify)..................................................
5. Date of the interview [__] [__]/[__] [__]/[__] [__]/[__]/[__]
6. Post of the interviewee in the organization........................................
   c) For how long have you been working with this organization? ..............
   b) Role of the interviewee in the organization

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ITN PROGRAM FUNCTIONING
1. What bed net related interventions is your organisation involved in?
...................................................................................................................
...................................................................................................................
...................................................................................................................
(Direct sale of ITNs [__] Education on use of ITNs [__] Free distribution of ITNs [__]
Working with the community ITN projects BI [__] Indirect sale of ITNs, others [__])

b) For how long has your organization been giving or selling bed nets in this
community? <1 yr [__] 1-3yrs [__] >3-5yrs [__] >5yrs [__]

c) How long does your organization plan to run the activity(s) named above in this
area?
<1yr [__] >1-3yrs [__] >3yrs [__] DK [__]

Explain why,
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2. What are the three core objectives for existence of your organization in this
locality?
   1. .........................................................................................
b) Can you tell me how these objectives Support or limit the ITN program?


c) How do you deal with the limitations?


SPECIFICS ABOUT TYPE OF NET DISTRIBUTED

3. What type of bed net is your organization dealing in? (Feel the table provided)
<table>
<thead>
<tr>
<th>Brand</th>
<th>Type</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Price</th>
<th>Supplier and how they access the supplier</th>
<th>How often run out of stock in last one year</th>
<th>How often restocked</th>
<th>Preference for net and reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanet, olyset etc</td>
<td>UTN, Pre treated, LLIN etc</td>
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</table>
b) What effect does the supplier of the bed net have on?

A. Affordability of net by community members
   ..........................................................................................................................
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B. Acceptance of the net by community
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C. Availability of the bed nets to community
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4. How do you store your bed nets?
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TARGET GROUP AND TARGETTING

5. What ITN programs does your program run, who does these programs target and how do you reach the target group (**fill in the table provided**)
<table>
<thead>
<tr>
<th>Target group(s)</th>
<th>How target group is identified</th>
<th>How they get the net to user</th>
<th>Challenges in process of distribution</th>
<th>Additional effort needed or challenge-related actions</th>
</tr>
</thead>
</table>

(Example of targets: Mothers, children <5, pregnant women, elderly, sick people, Orphans, poor, nano)  
(Example of challenges: too costly, bad roads, poor turn up at public gatherings, rejection of commodity by user, corruption etc)
9. **If not already mentioned**, does your organization conduct additional efforts to reach specifically the poor with bed nets?

Y/ N/ DK  [___]

If yes, explain

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b) Are there any specific constraints you face in reaching the poor with ITNs?

Explain

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OPINION ABOUT OTHER DISTRIBUTION STRATEGIES

10. Do you know of any organizations other than yours that have an ITN program in this area? Y [___] N [___] DK [___]

If yes, list them and type of program

1 ........................................................................................................

2 ........................................................................................................

3 ........................................................................................................

(Probe for effects of; Free ITNs in measles campaign and PSI activities)

c) How does the existence other distribution methods affect your own program?

Explain for each method named.

1 ........................................................................................................................................................................

2 ........................................................................................................................................................................

3 ........................................................................................................................................................................
c) What is your opinion of the different strategies used to distribute bed nets by the different programs? (Probe for each strategy named above - Are they reaching the most vulnerable? Any specific success or limitations of the strategies).

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2. .................................................................................................................................
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3. .................................................................................................................................
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11. In your opinion what has been the most successful strategy for getting the bed nets to the most vulnerable?

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Explain

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12. In your opinion has there been any specific law put in place that favours the distributors and dealers of ITN programs? Y [__] N [__] DK [__] if yes explain

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SUPPORT STRUCTURES FOR SUCCESS OF ITN PROGRAM

12. In your opinion has there been any specific law put in place that favours the distributors and dealers of ITN programs? Y [__] N [__] DK [__] if yes explain

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b) What is your opinion of the general environment that you are operating in?
Probe for things like, Taxes, infrastructure, promotion activities, licensing, communication etc

Post interview review

Summary of interview quality: Good – Average – Poor
Length of interview:

Any questions asked that were sensitive/ disliked?

Interviewee questions?
SEMI STRUCTURED INTERVIEW SCHEDULE (NGO and public health sector bed net distributors)

CODE …………………… Type of facility …………………

FACT SHEET
1. Name of facility ………………………………………………………………………
2. Date of discussion [__] [__]/[__] [__]/[__][__][__][__]
3. Post of interviewee in the facility …………………………………………………
   b) Role of the interviewee in the facility and in relation to bed nets
      ……………………………………………………………………………………………
      ……………………………………………………………………………………………

SPECIFICS ABOUT THE TYPE OF NETS DISTRIBUTED AND PROGRAM

1. What type of bed nets do you distribute in these programs? (Go to the table)
   Table to be filled from the natural group discussion with the distributors of bed nets either at health facility or NGO.
Table to be filled for the distributors of bed nets at the health facility and NGOs

<table>
<thead>
<tr>
<th>Brand Name eg Permanet, olyset etc</th>
<th>Type UTN, pre treated, LLITN</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Price</th>
<th>Supplier and how they access the supplier</th>
<th>How often restocked</th>
<th>How often run out of stock in last one year</th>
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</table>
### ITN PROGRAMS AND TARGETTING

<table>
<thead>
<tr>
<th>Program</th>
<th>Target group(s)</th>
<th>How target group is identified</th>
<th>How they get the net to user (distribution)</th>
<th>Challenges in process of distribution</th>
<th>Additional effort to reach target group</th>
</tr>
</thead>
</table>

(Example of targets: Mothers, children <5, pregnant women, elderly, sick people, Orphans, poor, non)

(Example of challenges: too costly, bad roads, poor turn up at public gathering, rejection of commodity by user, corruption etc)
b) **If not already mentioned**, does your Organization/Facility have a program targeting specifically the poor?

Y [___] N [___] DK [___] If yes what program is this?

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c) Suppose that someone not in the target group needed a bed net what would you advice them?

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(Probe: Are you aware of places you would refer them to get a bed net)

3. **Details of the Integrated Measles Campaign (Public health persons)**

a) Was your organization involved in distribution or design of the program? Y/ N [___] If yes, how exactly were you involved?

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b) Could you talk me through how the distribution was carried out?

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(Probe: Who did it target, How the target group were identified, how were the nets distributed, how was monitoring to ensure bed nets do not leak to non targets ensured, what else was done during the program)

c) What were the challenges in this strategy of distribution and could these have been avoided?

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d) Do you think this strategy was able to reach the very poor?
   Y [__] N [__] DK [__] Why? Explain
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e) What method would you recommend for reaching the very poor who are not reached with bed nets?
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PERCEPTION ABOUT DIFFERENT DISTRIBUTION METHODS

4. Are you aware of other organizations dealing in distribution of ITNs in this community? List them and explain how they work
   1. ………………………………………
   2. ………………………………………
   3. ………………………………………
   4. ………………………………………

4B) Have you heard of these distribution systems:
Sale of nets through the CBOs       Y / N  [__]
PSI shops                           Y / N  [__]
Free distribution (Govt or NGO)     Y / N  [__]
Commercial sale of bed nets         Y / N  [__]

For the one that the interviewee can identify; what is your opinion about?
   a) Method being able to reach the poor
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

   b) Method being accessible to the majority
   ……………………………………………………………………………………………
c) Challenges being faced in the operation of that method

4C. How do these organizations activities affect the work of your facility is doing with bed nets?

5. Free distribution of bed nets apart from IIC (if not already mentioned)

a) Are there instances that ITNs have been distributed in this community for free other than during the measles campaign, in the last one year? Y [___] N [___] DK [___]
   - If yes, when was this and who did it? How was the distribution done?

b) What would make someone from this community not to go and pick the free ITNs and how can this be solved?

b) What is your opinion of the free ITN distribution as a method of scaling up coverage with ITNs?

(Probe: Will it help the majority of people in this community, what of the usage of those nets? Is it sustainable, does it get to the poor, how it can be improved, what the
limitations are surrounding it, do you think nets distributed this way are put to proper use?

**COVERAGE**

6. In your opinion what is the coverage status of these community with bed nets?  
1-High  2- Average  3- Low  ____

b) In your opinion what role has the integrated measles campaign played in achieving this coverage?

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c) What role is played by other distribution methods in achieving this coverage?

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6. Until the recent measles campaigns when nets were integrated into the program, coverage data for ITNs had been low, especially among the poor,  

d) What has been the cause for the low coverage over the years?

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e) In your opinion what should be done to improve overall coverage and coverage of the poor with ITNs?

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7. What specific things in the community either promote the success of ITN programs or limit success of the ITN program and how do you deal with these?

(Probe: Literacy level, beliefs systems, language, wealth status, existing community systems and others).

8. In your opinion how would you rate the availability of ITNs to this community?
A – High    B - Ave    C – Low    D - Not Available    [__]

9. In your opinion, what is the best method of increasing coverage of ITNs in this community? Explain any suggested strategy in detail.

Post interview review

Summary of interview quality: Good – Average – Poor

Length of interview:

Any questions asked that were sensitive/ disliked?

Interviewee questions?
SEMI STRUCTURED INTERVIEW SCHEDULE FOR BED NET RETAILER OUTLETS (PSI and Commercial retailers)

CODE: ______________

DEMOGRAPHIC DATA CAPTURE SHEET

1. Name of the premise (if available) ………………………………………
2. Date of the discussion
   [___] [___]/[___] [___]/[___][___]/[___][___]
3. Venue of the discussion .........................................................
4. Location of the premise ............................................................
5. Sex of respondent  F / M[___]
6. Period for which the respondent has been selling nets at the premise
   A <1 yr  >  B 1- <3yrs  C >3-<5yrs  D >5yrs  [___]

Section B

Opening Question (Setting the mood)

• What things do you sell at this outlet?
  ……………………………………………………………………………………………
  ……………………………………………………………………………………………

• Are there any bed nets in stock now? Y / N [___]

ITN ACQUISITION AND CHARGING STRATEGY

1. What type of bed nets do you stock? Probe for; what brand names, is it ITN, UTN without treatment pack, LLITN, What shapes and colour other specifications (Go to the table attached)
<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Type</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Price</th>
<th>Supplier and how they access the supplier</th>
<th>How often restocked</th>
<th>How often run out of stock in last one year</th>
<th>Preference for net and reason</th>
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2. How do you determine the price at which you sell bed nets?
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3. Credit.
   3a. Are there times when you allow credit purchase for the bed nets? Y/N [__]
       If yes, under what circumstances? (E.g. who? Why?)
.................................................................................................................................
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   3b. How many people have you given bed nets on credit in the last month?
       ....................
       How many have repaid the debt so far? .................

4. How do you get the bed net to the end user/customer? Any efforts beyond them coming to the shop/point of delivery?
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   b) What challenges are faced in reaching the customers and how do you cope with them?
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TARGETTING AND TARGET GROUP

5. Do you have a particular target group for your bed nets?
   Y / N [__]
   a) If yes who are they and how do you identify and reach them?
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   (E.g. Pregnant mothers, children <5, poor, orphans, all women, elderly etc)
b) Any specific constraints with reaching these target groups? Explain further and how you cope with these challenges.

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(Probe: Social issues, economic issues, beliefs, language, literacy others)

SOCIAL ISSUES SURROUNDING DISTRIBUTION

6. In your opinion, are the people of this community aware about your work and the bed net products? Y / N / DK [___]
   -How would you rate their level of awareness and why?
   1- Excellent    2- Average    3- Poor    [___]

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7. Bed net promotion and communication
Do you carry out any promotional activities for bed nets?
Y / N [___]
If yes what methods have you been using and are they working for you?

<table>
<thead>
<tr>
<th>METHOD</th>
<th>IS IT WORKING?</th>
<th>REASON</th>
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C) In your opinion what more can be done to improve bed net awareness in this community? .................................................................
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PERCEPTIONS ABOUT OTHER DELIVERY STRATEGIES

8. Are you aware of other organizations other than yours that are running bed net programs (or selling) in this area?
   Y [___] N [___] If yes, feel in the table below,

<table>
<thead>
<tr>
<th>ORG</th>
<th>TARGET</th>
<th>GRP</th>
<th>DISTRIBUTION CHANNEL</th>
<th>FREE / SELL</th>
<th>KEY CHALLENGES FACED IN DISTR...</th>
<th>HOW ORG AFFECTS OWN PREMISE</th>
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</table>
9. The integrated immunisation campaign:

a) Are you aware of the integrated immunization campaign (where bed nets were given free in the measles campaign)? Y / N [__]

b) What is your opinion of the method through which the nets were delivered to the beneficiaries? (E.g. reaching the poor, practical organisation)

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c) Could anything have been done differently? Y/ N [__]

   Explain further?

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d) Did you get involved with the campaign in any way? Y/ N [__]

   If yes, how were you involved?

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e) Did it impact on your operations at the time? Y/N [__] if yes, explain in what way
f) Are these effects still present? Y/N [__] Explain,

OPERATING ENVIRONMENT

10. Are you aware of any favourable legislations/ Government policy that encourage you as a bed net retailer? Y/ N [__] Explain

b) What is your opinion of the infrastructure (transport and communication network) and how it affects your operations as a distributor/ retailer?

11. From your experience in this business how would you rate your bed nets as a commodity?

1- Fast moving  2- Average moving  3- Slow moving  [__]
b) What makes you say that? What would you attribute to the rating on the scale?
   Explain
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
c) In your opinion is there anything that can be done to improve this rating? Y / N [__]
   Explain.
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
12. Are there months in the year when you sell more bed nets than normal? Y / N [__]
   If yes above, which months are these and why?
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
13. For how long do you foresee yourself working in this business and why?
   A- 1yr or less   B- >1 yr-3yrs   C- >3yrs   DK   [__]
   ………………………………………………………………………………………
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Post interview review

Summary of interview quality: Good – Average – Poor
Length of interview: ………………………
Any questions asked that were sensitive or disliked?
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Questions asked by interviewees?