FACTORS INFLUENCING THE RECEIPT AND UPTAKE OF INSECTICIDE TREATED NETS BY PREGNANT MOTHERS UNDER THE NATIONAL DISCOUNT VOUCHER SCHEME, KIBAHA DISTRICT

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH OF THE UNIVERSITY OF DAR-ES-SALAAM, 2005

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University of Dar-es-Salaam a dissertation entitled: ***"Factors influencing the receipt and uptake of insecticide treated nets by pregnant mothers under the national discount voucher scheme in Kibaha district,"*** in partial fulfillment of the requirements for the degree of Master of Public Health.

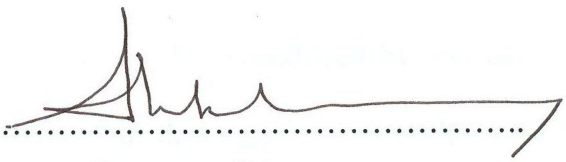
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Signature.....

Date.....28.10.2005.....

DECLARATION

I, Thomas Shenkalwa, declare that this dissertation is my original work and has never been submitted for a diploma or degree in any other University.

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DEDICATION

This dissertation is dedicated to my wife who always reminded me of the importance of going for post graduate studies.

ABSTRACT

The Ministry of Health, Tanzania through the National Malaria Control Programme introduced the discount vouchers scheme for ITNs purchased by pregnant mothers so as to improve coverage of ITNs use in pregnancy. This study examined the factors that might influence receipt and up take of ITNs by pregnant mothers under the discount voucher scheme so as to identify actual or potential barriers to the implementation of the scheme.

A total of 425 pregnant mothers, the DMO, 8 RCH staff and 6 net sellers participated in the study. More than two thirds (69.6%) of the mothers recognized malaria as a common health problem in pregnancy. Awareness of mosquitoes as malaria vectors was very high as was shown by over three quarters, of the mothers reporting using nets for malaria prevention . ITNs were perceived by the absolute majority of the mothers to have the ability to repel or kill mosquitoes, with three quarters of the mothers believing that the insecticide used is safe. Willingness to pay was also very high as around two thirds of the mothers indicated that they would pay top up money the soonest. There were no barriers on issuance and receipt of vouchers as the majority (82.5%) of mothers on subsequent antenatal visits had received their vouchers, three quarters of whom had already bought nets.

Operationalization of the scheme from views of the DMO and RCH staff seems to face actual or potential barriers in implementation in terms of storage, issuance and safety of

vouchers outside the clinic. Delays of up to two weeks to get supplies of vouchers was common as well as in ability of some mothers to get top up money. There were no barriers to retail net seller for the procurement of net, issuance of the nets to mothers and redemption of vouchers. However there was variation on instructions for insecticide dilution with the potential for incorrect dilutions that would make it ineffective.

We conclude that save for the observed barriers; the scheme is smoothly being implemented. The observed barriers should be addressed so as to achieve optimal effectiveness. There is the need to ensure that mechanisms for sustainability of the scheme are put in place and implemented early enough before donor withdrawal.

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LIST OF ABBREVIATIONS

CHMT	- Council Health Management Team
EPI	- Expanded Programme on Immunization
GFATM	- Global Fund for AIDS, Tuberculosis and Malaria
IHRDC	- Ifakara Health Research and Development Centre
IPT	- Intermittent Preventive Treatment
ITNs	– Insecticide Treated Nets
LSHTM	- London School of Hygiene and Tropical Medicine
MCH	– Maternal and Child Health
MEDA	- Mennonite Economic Development Associates
MOH	– Ministry of Health
MUCHS	– Muhimbili University College of Health Sciences
NGO	- Non Government Organization
NMCP	– National Malaria Control Program
OPD	– Out Patient Department
PSI	- Population Services International
RCH	– Reproductive and Child Health.
RHMT	- Regional Health Management Team
SP	- Sulphadoxine Pyrimethamine
STDs	- Sexually Transmitted Diseases
WHO	– World Health Organization

CHAPTER ONE

1. INTRODUCTION

Malaria continues to be the most serious public health problem in Sub-Saharan Africa and poses a serious impediment of socio-economic development. Worldwide there are approximately 300-500 million cases of malaria annually where, it is estimated that 1.5 to 2.7 million deaths occur due to malaria annually, with Sub-Saharan Africa accounting for over 90% of all reported cases of malaria. Pregnant women and underfives are the most affected groups with various effects; about 1 million deaths due to malaria in underfives occur annually. But besides these directly measured effects, malaria through the economic costs and lost time of productivity leads to poverty.

The situation in Tanzania is similar to the global view, with more than 75.0% of the country being hyper-to holo-endemic for malaria (MoH 2002). The coastal zones and neighboring areas are the most affected, constituting about 42% of the population. In Tanzania the estimated number of malaria cases is 14-18 million per year. Deaths due to malaria are around 125,000 people with estimated 70-80,000 deaths to be those of less than 5 years old. A calculated incidence is 500 per 1000 population but this is known to be twice as much in the less than 5 years age group (MoH, 2002). The groups most affected / vulnerable are pregnant women and underfives. Malaria is the leading cause of outpatient attendances at health facilities in Tanzania for all age groups. Considering underfives, malaria constitutes 38.0% of outpatient attendances and 43.0% admissions;

and is the leading cause of death being responsible for 31.0% of child mortality and 19.0% adult mortality. Generally malaria accounts for about 30% of the national disease burden in Tanzania. Malaria is associated with anaemia in both children and pregnant women; in pregnant women malaria is also associated with abortions, intrauterine growth retardation, stillbirths as well as premature delivery and low birth weight that may affect neonatal survival.

Since August 2001 the government of Tanzania has recommended all pregnant women to be given SP twice during the course of their pregnancy (MOH, 2001). The first dose of SP is given in the 20th week of pregnancy and the second dose in the 30th week of pregnancy. If antenatal clinic attendance is irregular, the first IPT dose should be given anytime between 20th and 28th week and the second IPT dose anytime between the 30th and 36th week. Thus, Tanzania is now promoting intermittent preventive treatment (IPT) and use of insecticide treated nets (ITNs) with the aim of improving the health of pregnant mothers, birth outcome and survival of the newborns. To promote ITNs coverage in pregnant mothers, the Tanzanian government in collaboration with other partners, has introduced a discount voucher scheme for the nets and deltarmethrine insecticide kit purchased by pregnant mothers. Deltarmethrine is the chemical name for the insecticide commonly used for net treatment, with a trade name of "NGAO" in Tanzania. This study aimed to explore the factors that might influence ITNs use and identify the barriers to the implementation of the National Discount Voucher Scheme for ITNs supplied to pregnant mothers.

1.1 PROBLEM STATEMENT.

Although ITNs have been shown under controlled research conditions to be an efficacious tool for the control of malaria and anaemia in pregnancy, it is not known how it would work under operational conditions. Thus, although a very high proportion of pregnant mothers attend to antenatal clinics where they receive information, education and behavioural change communication messages regarding ITNs use in pregnancy, not all the mothers would take this intervention. A number of socio-cultural factors such as awareness on the benefits, availability, accessibility, perceived efficacy & safety of the interventions and convenience for use might influence receipt and uptake of these interventions. Thus, in one large study, only a very small proportion (5.0%) of pregnant women had slept under an ITN (Guyatt et al., 2004). It has been shown that use of ITNs is influenced by the weather such that ITNs are less likely to be used in hot weather that characterizes most areas with intense malaria transmission (Alaii et al., 2003). Use of ITNs to control severe malaria presenting as severe anaemia (severe pallor) or cerebral malaria (convulsions with coma) will depend on the local perceptions of the causes of the manifestations. The causes of severe pallor (lack of blood) and convulsions / coma (dege dege) are quite often not linked to mosquito bites or malarial disease per se (Winch et al., 1996, Minja et al., 2001). These observations raise the fear that even after offering subsidized ITNs, the coverage for pregnant mothers may not be optimal. There are complaints that the insecticide is not effective, and some people in Dar es Salaam claim that they sometimes use 2 to 3 doses at a time with little or no effect (The Guardian, May 25th 2005). Though the discount voucher scheme seems

attractive and the top up money to be given by the pregnant mothers seems small, not all pregnant mothers would afford. Thus one pregnant mother who received the voucher in January 2005 had, until May 9th 2005, not been able to pay the top up money (Tanzania Daima, 9th May, 2005). Several other factors such as the delivery and distribution of vouchers, the capital flow of the net seller, distance to the net seller and the net wholesaler may conceivably influence ITNs coverage to pregnant mothers.

This study sought to address the questions:

Are pregnant mothers aware of malaria as a health problem to them and the foetus? Are they aware of the available control measures? What notions do pregnant mothers have regarding the efficacy and safety of the insecticide used in net treatment? How is the discount voucher scheme for ITNs to be purchased by pregnant mothers being implemented? What are the barriers to the implementation of this scheme?

1.2 Rationale and significance

The study was set to investigate the factors that influenced receipt and uptake of ITNs by pregnant mothers under the National Discount Voucher Scheme (HATI NPUNGUZO) and identify actual & potential barriers to the implementation of the scheme. The success of the national malaria control in pregnancy through use of ITNs under the National Discount Voucher Scheme would depend on the affordability for the top up money and physical accessibility to net sellers as well as behavioural changes for consistent net use and re-treatment by pregnant mothers (van Eijk et al., 2004). This in

turn would depend on the perceived efficacy and safety of the ITNs. Although there was a national advocacy on the efficacy and safety of ITNs and that a discount voucher scheme for pregnant mothers has been introduced; coverage and adherence were not yet optimal. This study therefore intended to generate information that will be incorporated in the national advocacy campaigns to promote the wider coverage of ITNs use by pregnant mothers under the national discount voucher scheme so as to enhance health and survival of pregnant women and infants (Hawley et al., 2003).

1.3 STUDY OBJECTIVES

Broad objective.

To examine the factors that influence receipt and uptake of Insecticide Treated Nets (ITNs) by pregnant mothers under the National Discount Voucher Scheme and identify barriers to the implementation of the scheme.

Specific objectives.

1) To explore the awareness of malaria as a health problem to the pregnant mother and the available control measures
2) To explore pregnant mothers' awareness of mosquitoes as the transmitter of malaria and the available measures for mosquito control.
3) To explore pregnant mothers' awareness of the National Discount Voucher Scheme for ITNs and perceived safety & efficacy of the insecticide used in nets.
4) To examine pregnant mothers' receipt of discount vouchers and purchase of ITNs from the net seller
5) To assess the barriers to the implementation of the National Discount Voucher Scheme for ITNs purchased by pregnant mothers.

CHAPTER TWO

2.0 LITERATURE REVIEW:

Malaria has been a major cause of morbidity and mortality in many parts of the world for many centuries. Hippocrates the father of medicine described it around 400 BC. Prevention and control measures for malaria have been practiced for an equally long period without permanent solution to all affected regions, the African continent included.

Provision of prompt malaria diagnosis and treatment should be a key component of any malaria control program, but in reality disease management is often not adequate due to weakness in the health systems. Especially in areas where access to health services and proper medication is limited and where parasites have become resistant to antimalarial drugs, insecticide- treated nets present an attractive alternative to complement malaria control tools. In a study conducted in the Kilombero valley it is demonstrated that dynamic view of malaria related knowledge and practice opens innovative lines of inquiry, which may contribute to enhancing the effectiveness of ITNs interventions (Minja et al, 2001). She says there is little knowledge and experience regarding the best strategies to motivate and inform people about the potential of using treated bed nets and regular re-treatment in order to achieve high coverage and compliance for better impact. In the same study on local knowledge about febrile illnesses when respondents were asked regarding ITN ownership 84% responded in the affirmative while 16%

expressed a dislike. Those who desired to have an ITN gave explanations as to the potential of the insecticide to repel and kill mosquitoes. About 18% attributed the desire to malaria protection as a motivation. Related reasons such as repelling and killing household pests (9%) and simply having good nights sleep were given (6%). On a general opinion about the safety of the ITNs 45% of respondents shared the agreement that the insecticide reduced mosquito nuisance. About 17% referred to the fact that the insecticide was poisonous and questioned the safety of ITNs especially for children.

Two main preventive strategies can be applied for the elimination of malaria by eliminating the sources of infection to cut off the transmission cycle. Another important measure is to eliminate people's exposure to the vector. These measures are all comparatively expensive and developing resistance to conventional drugs by the parasite and resistance to insecticides by the mosquito worsens the situation. Cutting off the exposure of humans to mosquitoes can be achieved by several measures including destruction of breeding sites, treating these sites with insecticides, to kill the adult vectors with their larva forms, directly killing the adult mosquitoes by spraying or other means and the using of mosquito nets.

In the 1950s, attempts by the World Health Organization to eradicate malaria by indoor spraying was only successful in a few countries because of badly planned programs which disregarded the different and complex transmission patterns for malaria. Another factor contributing to the failure of the program is the economic status of the affected

nations where in some cases even the basic health care cannot be afforded for all. Even those countries, which were willing to make short-term financial commitments for malaria eradication, were not able to support long-term programs. Because of these problems mentioned here, most countries in the developing world have decided to abandon the control programs.

One of the present measures found to have the strongest evidence based vector control effectiveness is the Insecticide Treated Net. However, the cost of these nets is beyond the affordability of many families in the developing countries Tanzania included (John Adams et al., 2001). It has been observed that there is already a wide spread use of mosquito nets especially in urban areas up to a coverage of 82% of house holds in Mwanza Tanzania having at least one bed net (MOH,2002). On the other hand the overall coverage for Insecticide Treated Nets (ITNs) is as low as 12%.in the whole population. The most vulnerable groups have still very low utilization of treated nets. Only 11% of children who are less than 5 years of age sleep under a net. It is only 8% of pregnant women who are reported to sleep under ITNs (MOH, 2002). Availability and use of bed nets varies according to location whether in town or village, malaria transmission patterns and the presence of malaria control projects in the area. Experience shows that it is possible to increase the coverage of mosquito nets across all social classes but problem remains with the re-treatment of the nets with the insecticide.

In April 2000 African leaders signed the Abuja Declaration committing themselves to protect 60% of the African children from malaria with treated bed nets (Abuja Declaration 2000). Evidence by studies conducted in Tanzania, has shown that Insecticide Treated Nets protect under five years children by improving their survival by 27%. And children under age of two years showed a marked reduction in the prevalence of parasitaemia and anemia associated with malaria. When planning to embark on projects for increasing use of ITNs it is important to put into consideration the socio-economic status of the target community. Other important areas of concern are the gender issues because men rather than women control the economy of most families. Coincidentally it is the men who are decision makers as to who should use the mosquito net in the house. Besides the disadvantages posed on pregnant women for that matter, the children are generally worse affected than the adults. Women in the African communities in general are economically weak and they are the ones particularly at high risk of malaria infection when they get pregnant. And the infants born from unprotected mothers are equally vulnerable. Protecting the mother during pregnancy improves the chance of protecting the child on several aspects including normal birth weight and stillbirth. Many of the families affected by malaria are poor and when a member of this family gets sick the economic burden is increased even further, and it is more serious when the breadwinner is the one who has fallen sick.

This situation calls for special emphasis on the availability of insecticide treated nets at subsidized prices to allow for the poor and vulnerable groups to be able to buy.

Subsidies can come from the government or non-governmental organizations working as partners. However while advocating for subsidies it is also important to make note that the common market must be protected for the projects to be successful. Ways of protecting the common market may include waving of taxes so that the commodities can be sold at cheaper prices. Other areas of concern are that on introduction of subsidies to specific groups example the pregnant women or under five years old the target may not be reached. Someone who is not eligible can divert the subsidy to serve some other purpose or it may be used for the intended purpose but not necessarily by the targeted individual. The more economically better are known to benefit more from subsidies than the poor. Even when the subsidies are available other problems have been noticed on the utilization. In a study done in Kilombero Tanzania (Adiel Mushi et al., 2003) it was noted that only 23% of socially marketed nets were exchanged for discount vouchers. In four years time in the same study only 97% of the vouchers were actually used. Awareness was also noticed to be a problem in this study. After two years of the study project only 43% of targeted women were aware of the scheme. Of those who were eligible and aware of the scheme only 30% made use of the subsidy. It was also observed that only 2% of women who had heard of the scheme a year ago utilized the service i.e. used a voucher. Some women in the study project did not make use of the voucher because they already had a bed net at home.

Risks do exist with the discount voucher systems. One is the danger of leakage where people outside the intended group take up the benefits of the scheme. Another risk is

freezing the commercial market if the scheme is not properly planned in such a way that while the subsidy exists the commercial market is at the same time encouraged to grow/flourish e.g. by removing taxation and tariffs thus avoiding crowding out of the traders. Sometimes the vouchers may be exchanged with goods other than the ITNs or the insecticide packages.

Pregnant women attribute various reasons to not using ITNs and some of the explanations include lack of money as being the main obstacle. Money is most of the time in the African setting provided by the husband, except for a few exceptions who provide the money themselves (T. Marchant et al, 2002). Despite the awareness creation in a study conducted in Kilombero some pregnant women could not raise the money for the discounted price, and some did not need the ITN because they were currently using one. A few had not understood how to use the voucher. Sometimes the women may have other economic burdens of more priority than buying an ITN (Mushi et al, 2003). Social marketing of ITNs in Tanzania has proven to be a powerful method of ITN use by pregnant women. (Abdullah et al., 2003).

There is some experience with the discount voucher scheme in Kibaha District. The scheme has been operating in this area on a pilot basis since 2003 .There were two main phases, the first one beginning in June, 2003 and the second phase took over in January 2004. Some evaluation was done during the pilot study looking at the extent of knowledge on the usefulness of the Discount voucher scheme amongst pregnant women

attending the MCH clinics. In the first group 65% had knowledge about the importance of the discount voucher system. In the second group 70% of the pregnant women interviewed after four months interval knew about the benefits of the discount voucher system. About 40% and 50% of pregnant women in the respective groups knew the steps of treating a bed net. (Care Int., 2004). In the first period of April to December 2003 it is only 63% of the expected target of discount vouchers that were distributed to pregnant women. Only 65% of the total number of vouchers issued (5,000) were presented for redemption.

The study revealed some challenging areas which included community misconception on the insecticide used in treating nets. The other problem was the control of the price of nets delivered through vendors. Male participation in the ITN discount voucher scheme was limited while these are essential stakeholders due to the cultural influence on women's decision making, with regard to monetary issues. It was observed that some of the RCH staff insisted that pregnant women had to provide proof for their ability of topping up for the purchase of the intended bed net before issuing them with a discount voucher. Some pregnant women were observed to have misused the vouchers in some way or another. In a pilot study in Kibaha, shortage of discount vouchers was noted as a barrier to the implementation of the scheme.

This study examined the factors influencing receipt and uptake of ITNs under the National Discount Voucher Scheme in Kibaha district; and identified actual and potential barriers to the implementation of the programme.

CHAPTER THREE

3.0 METHODOLOGY:

3.1 Study setting

The study was conducted in Kibaha district which is just off the coastal belt and where the transmission of malaria is perennial. Kibaha is one of the six districts of the Coast region. It has an area of 1630 sq. km. Population is estimated to be 132,035 people according to 2002 national census. The headquarters are 35 km. West of Dar-es-Salaam along the Dar-es-Salaam Chalinze highway. It borders Kisarawe, Bagamoyo, Kinondoni and Morogoro rural districts. There are two main rain seasons around the months of November-December and March to May. Its inhabitants are a mixture of five main tribes and immigrants from Kilimanjaro region. They are mainly peasants of a low social economic status. In Kibaha district, malaria is the leading cause of OPD attendances (51%). It is also a leading cause of mortality (31%) in underfives and is attributed for 29% of maternal deaths in the district. Generally the uptake of health interventions is high, for example the EPI coverage was 96.2% in 2003. (RHMT Coast Region annual report., 2003.)

The district has been operating as a pilot study area for the National Discount Voucher Scheme for ITNs purchased by pregnant mothers, a project initiated in July 2003 –June 2004. It is ahead for at least one year, to the other districts in Tanzania. Since October

2004 the other districts are gradually engaging in this important scheme which is planned to extend up to June 2007 having covered the whole country.

The Ministry of Health in Tanzania through the National Malaria Control Programme (NMCP) as the overall incharge of all activities in the programme implements the Discount Voucher Scheme for ITNs supplied to pregnant mothers in collaboration with other partners such as GFATM, MEDA, CARE, World Vision, IHRDC and LSHTM. GFATM are the main funding agents while MEDA are the production and distribution agents for the discount vouchers in the scheme. CARE Tanzania and World vision conduct training and mobilization while IHRDC and LSHTM monitor the programme; auditing by KPMG Peat Marwick.

Each discount voucher worth Tsh. 2750/= was strictly issued to pregnant women at the first attendance to the RCH clinic. Procedure of issuing a voucher began with full registration of the pregnant women, which included entries of all particulars on the MCH card and a home address. Then a discount voucher with detailed entries of identification was issued and its stub with similar entries was retained. The mother took the voucher to the net seller and upon payment of the top up money she collected the net and insecticide. Further steps were taken by the shopkeeper to channel the discount voucher for refunds through wholesalers.

When the baby is taken to the postnatal clinic for the third DPT-HB (at age of three months) and the measles vaccines (at the age of nine months). Insecticide re-treatment kits for the bed net were issued free of charge.

3.2 Study design & population

A facility based cross sectional survey was conducted in Kibaha district during the months of May and June 2005. The study population consisted of: (1) pregnant mothers attending to RCH clinics (2) selected net sellers, and (3) selected RCH staff and the District Medical Officer. The RCH clinics were sampled for convenience (purposeful sampling).

3.3 Sample size estimation and sampling procedure for antenatal mothers.

We assumed that 50.0% of pregnant mothers who were attending to RCH clinics received discount vouchers for ITNs. The sample size of antenatal mothers who were receiving discount vouchers was calculated by the formula for cross-sectional surveys: $\mathbf{N = Z^2Pq/d^2}$: where Z is the standard normal deviate set at 1.96, P is the estimated proportion of mothers receiving discount vouchers for ITNs, $p = 1 - P$ and d is the error margin set at 0.05. This gave a minimum sample of 385 antenatal mothers; adding a 10.0% non-response, the maximum sample required was 425 antenatal mothers from the respective RCH clinics. Of the 425 antenatal mothers, 157 were on their 1st visit and the rest 268 were on subsequent visits. The sample of antenatal mothers was purposefully categorized into 1st and subsequent visits to allow the assessment of

voucher provision to pregnant mothers and the use of vouchers to purchase nets and insecticide kits. Tumbi, Mwendapole, Kong owe and Mlandizi RCH clinics were sampled for convenience (purposeful sampling.

3.4 Study procedures

3.4.1 Development of research instruments

Structured questionnaires were developed for interviewing antenatal mothers attending to the respective RCH clinics. Question guides for in-depth interviews were developed for interviewing the DMO, RCH clinic staffs and net sellers. The questionnaires were pre-tested to ensure clarity and consistency, and a final unambiguous version was produced for use in the field.

Pretesting of the questionnaire was done by the research team at Tumbi hospital where the attendance of antenatal mothers was high. The purpose of pre-testing was to check on the consistency and clarity of the questions in the tool. Modification and deletion of some questions was done as was found necessary. Pre-testing results are not included in research data.

3.4.2 Selection and training of research assistants.

Four research assistants were selected to assist in conducting the research. Orientation was first given on the interview schedule and skills which would be employed in order to have the respondents' confidence and full cooperation throughout the interview. An

over view on the whole purpose of the study was given to make them feel responsible. Insistence was made on maintaining respect and confidentiality to the mothers and avoiding unnecessary wastage of their time. They were also reminded on the importance of obtaining a signed consent from the mothers before beginning the interviews.

3.4.3 Outlet interview of antenatal mothers'

Antenatal mothers at the exit point from the RCH clinics were invited to participate in the study. Purpose of the study was explained to each mother and consent for participation in the study was obtained. Consecutive consenting mothers were interviewed using provided questionnaire. The socio-demographic characteristics were recorded, followed by information on awareness of malaria as a health problem to the mother, awareness of mosquitoes as the transmitters of malaria and the methods of control. The interview also addressed awareness, perceived efficacy and safety of ITNs as well as awareness on the discount voucher scheme for ITNs. Awareness on the process of collecting discount vouchers and purchase of nets and the associated actual or potential barriers were also assessed.

3.4.5 In-depth interview with the DMO.

The District Medical Officer was to be interviewed on the management issues related to the national discount voucher scheme for ITNs purchased by pregnant mothers. Since the District Medical Officer was away during the study period, so the District Malaria Control Coordinator was interviewed instead. The interview addressed CHMT's

procurement, distribution, storage and stock management of discount vouchers distributed to RCH clinics.

3.4.6 In- depth interview with RCH clinics workers

Two RCH workers from each health facility were interviewed. The interview included receipt, registration and storage of vouchers as well as issuance to mothers attending to the RCH clinics, registration and instructions on where to take the voucher and the necessary top up money for the purchase of nets and insecticide. The interview also addressed barriers to smooth operation of the scheme at the RCH clinics.

3.4.7 In-depth interview with net sellers

At most two net sellers in close proximity to each RCH clinic were selected. Each net seller was interviewed regarding the business of net selling under the discount voucher scheme. Interview was focused on capital flow, distance to the net wholesaler, the amount of top up money charged for different nets as well as registration and procurement of nets and insecticide packets.

3.5 Data management and analysis.

Data collected was checked on the same day to make corrections of errors made in the field. Errors were rectified before data entry and processing. The quantitative data was cleaned and entered into EPI Info data entry computer programme for processing and analysis. The quantitative data was organized in frequency distributions and cross-

tabulations as indicated; proportions were compared by the chi-square test at the significance level of 0.05. The qualitative data was organized as narrative through content analysis.

3.6 Ethical issues and research clearance.

Ethical clearance and permission to conduct the study was obtained from the Directorate of Research and Publications of The Muhimbili University College of Health sciences (MUCHS).In the field permission to conduct the study was given by Coast Regional and Kibaha District authorities. For each respondent included in the research the aim of the study was explained and a verbal consent to participate was obtained. They ware all assured of confidentiality and anonymity.

3.7 Limitations of the study.

Interviewing mothers at the exit point of the clinics might have biased the responses and time for field work was not enough. The research assistants were therefore cautioned not to ask leading questions and avoid getting into the trap by suggesting answers to posed questions. Because of the time limit we were forced to opt for purposeful sampling.



3.8 Definition of terms.

Insecticide treated nets: Bed nets impregnated with an insecticide, commonly permethrin.

Stable malaria: occurs where there is seasonal intense transmission for 3 to6 months in a year.

Perennial malaria: occurs with intense transmission throughout the year.

Unstable malaria: occurs with transmission period of not more than 3 months a year.

Discount voucher for ITNs: Is an official receipt issued to pregnant women as a subsidy for purchase of a bed net and a treatment kit.

CHAPTER 4

RESULTS:

A total of 425 pregnant mothers with an age range between 14 and 42 years were interviewed (Table 1). More than half (59.6%) of the mothers were aged below 28 years.

Table 1: Distribution of the study population by age groups. (N = 425)

Age group (years)	No.	%
14-20	104	24.5
21-27	149	35.1
28-34	129	30.4
35+	43	10.1
Total	**425**	**100**

About two thirds (64.2%) of the mothers were on their second or more pregnancies; while only 35.1%were on their first pregnancy. The mothers were attending to the Reproductive and Child Health Clinics as early as gestational age of 16 weeks. More than half (57.6%) of the mothers were in the gestational age of 24 weeks or below (as shown in Table 2).

Table 2: The distribution of pregnant mothers attending to the respective Reproductive and Child Health Clinics by gestational age.

Gestational age (weeks)	No.	%
16/40	65	15.3
17-20	94	22.1
21-24	86	20.2
25-28	62	14.6
29-35	79	18.6
36-40	39	9.2
Total	**425**	**100.0**

Majority (71.0%) of the mothers were married, 17.6% were single, 8.2% were cohabiting and smaller proportions 1.9% and 0.9% were divorced and widowed respectively.

It was observed that 71.3% of the pregnant mothers had primary education; a small percentage (11.0%) had secondary education and above, while 16.7% had no formal education.

Awareness of malaria as a health problem to pregnant mothers and available control measures.

When asked as what health problems especially affected pregnant mothers in their community, the mothers had multiple views as shown in table 3.

Table 3: The distribution of reported health problems affecting pregnant mothers in Kibaha District. (multiple response analysis)

ATTRIBUTE	NO	%
Malaria	297	69.9
Anaemia	77	18.1
Cough	22	5.2
Typhoid	49	11.5
Worms	23	5.4
STDs	14	3.3

On a multiple response analysis, malaria was mentioned to be the most common health problem (69.6%), while anaemia ranked second (16.0%) as a major problem affecting pregnant mothers.

When asked on the risk of getting malaria and anaemia during pregnancy, majority (93.9%and94.4% respectively) of the mothers answered in the affirmative.

Table 4 shows the different measures employed for the prevention of malaria. In a multiple response analysis, use of bed nets was the most commonly used preventive measure which was mentioned at a frequency of 77.3%.

Table 4: Frequency distribution of perceived preventive measures against malaria by pregnant mothers in Kibaha district, 2005 (multiple response analysis).

Attribute	No	%
Not working too long in the sun	3	0.7
Avoid rain falling on you	9	2.1
Leveling of pot-holes	45	10.6
Hygienic surroundings	66	15.5
Taking malaria medicines (SP) IPT	47	12.8
Keeping mosquitoes away	12	2.8
Burning mosquito coils	34	8.0
Mosquito nets	329	77.3

Awareness of mosquitoes as malaria vectors and their control:

The absolute majority (97.9%) of the pregnant mothers stated that there were mosquitoes in their localities during the survey. The seasonality of mosquito presence in the pregnant mothers' localities is shown in Table 5. Over two thirds (66.4%) of the pregnant mothers indicated that mosquitoes are a major nuisance during and just after the rainy season. Less than a quarter (16.9%) of the pregnant mothers indicated that mosquitoes were present throughout the year. Only a small percentage (4.7%) of the mothers indicated that mosquitoes were also present in the hot and dry season. The rice-harvesting season was reported to be associated with the presence of mosquitoes at a frequency of 8.2%.

Table 5: The reported seasonality of mosquito presence in the local communities in Kibaha district. (N = 425)

Attribute	No	%
Present all year around	72	16.9
Present during/soon after rain season	282	66.4
Present during rice harvest	35	8.2
Present during hot dry climate	20	4.7
Not sure	16	3.8

When asked as to which illnesses they would suffer when bitten by mosquitoes, more than three quarters (82.1%) of the mothers mentioned malaria as the illness that they

will contract (Table 6). A small proportion (12.9%) mentioned elephantiasis as the ailment that they would get after mosquito bite. Biting nuisance (itching of the skin) was mentioned only by a small percentage (5.2 %) of the mothers.

Table 6: Frequency of perceived ill health resulting from mosquito bite by pregnant mothers. (multiple response analysis)

Attribute	No.	%
Itching of the skin	22	5.2
Malaria	349	82.1
Abdominal discomfort	15	3.5
Cough	5	1.2
Elephantiasis	55	12.9
No illness	1	0.2
Sleep disturbance	2	0.5

Table 7 shows the distribution of measures taken to prevent mosquito bites in the same study population. A high percentage (82.8%) of the mothers mentioned use of mosquito nets for malaria prevention.

Table 7: Distribution of reported measures taken by pregnant mothers to prevent mosquito bites. (N = 425)

Attributes	No.	%
Use nets	352	82.8
Insecticide spray	14	3.3
Burn coil	33	7.8
Drive away with cloth	5	1.2
Do nothing	10	2.4
Others	11	1.2
Total	**425**	**100**

Awareness, perceived efficacy and safety of ITNs and their acquisition through the discount voucher scheme.

Regarding family members who sleep under a bed net, the data show that more than three quarters (85.2%) of the mothers sleep under a net. Children under five years of age sleeping under a net comprised 7.5%; older children 0.7%. Only a small proportion (4.2%) of some families did not sleep under a net. In a very small proportion (1.2%) of the families, the husband alone slept under a net.

Table 8: The distribution of family members sleeping under a bed net (N = 425)

Attributes	No.	%
Under 5 children	32	7.5
Older Children	3	0.7
The pregnant mother	362	85.2
The husband	5	1.2
None	18	4.2
Did not answer	5	1.2
Total	**425**	**100**

A high percentage (85.2%) of the mothers reported sleeping under a net. Of the 362 pregnant mothers reporting sleeping under a net, 30.8% were on their 1st antenatal visit while 54.6% were on their subsequent antenatal visits. Pregnant mothers on subsequent antenatal visits were highly significantly more likely to report sleeping under a net than pregnant mothers on their first visit ($p<0.001$).

Amongst the perceived benefits of sleeping under a net, majority (86.6%) of the pregnant mothers mentioned malaria prevention as a leading driving force. A small percentage (10.4%) mentioned keeping off mosquitoes so as to have undisturbed sleep.

When asked on the differences between insecticide treated nets and none treated nets, as well as the perceived effectiveness of treated nets for the prevention of malaria, almost

all (98.4% and 97.4% respectively) the mothers answered in the affirmative that treated nets have the ability to kill mosquitoes.

More than three quarters (82.1%) of the mothers believed that the insecticide used to treat nets was safe. Only a small percentage (11.3%) thought that the insecticide was not safe. Those who thought the insecticide was not safe believed that if an individual tasted the chemical then she could be poisoned.

Regarding awareness of the existence of the National Discount Voucher scheme for ITNs, almost all (94.4%) of the mothers had heard about the program. The sources of information for the voucher scheme ranged from the antenatal clinics (64.2%), the radio and television (20.2%) to the newspapers (4.5%)

More than half (61.7%) of the pregnant mothers thought the Discount Voucher Scheme benefited mothers with low income who would otherwise fail to pay full costs of a bed net. Only a very small percentage (2.8%) presented their views as a complaint that there are still mothers who could not pay the toping up costs to buy a net.

Regarding the number of visits to RCH clinics the data showed that those who had attended to the clinic for more than once comprised about 63.1% while those on their first visit were 36.9%.

stocking nets for the scheme. Only small percentages (4.5%) were not directed as to where they would get the service. Regarding the distance from the respective shops to their home places 76.6% of the pregnant mothers categorized them as being short distances. Less than a quarter (23.4%) of the mothers regarded the distance in between their homes and the shops stocking nets for the scheme as distant. About two thirds (61.9%) of the mothers who had received discount vouchers were ready to pay the topping up money almost immediately for purchase of a net. A small percentage (12.4%) of the mothers were uncertain or not decided as to when they are going to buy the nets, while 19.0% were relying on their husbands decision to pay for the net.

Mechanisms of ITNs acquisition by women on their subsequent visits.

The data show that the majority (82.5%) of the mothers on their subsequent visits to the RCH clinics had received discount vouchers for purchase of bed nets and insecticide treatment kits. Less than a quarter (17.5%) of the pregnant mothers had not received the intended discount voucher of the national scheme. Similar findings were reflected in the rate of purchase of bed nets and deltarmethrine treatment kits through the scheme's discount vouchers. Three quarters (77.6%) of the mothers had used their discount vouchers to buy nets and treatment kits. Less than a quarter (22.4%) of the mothers had not yet used the vouchers they were given at the clinics to acquire nets and treatment kits. Majority (93.0%) of the mothers on subsequent visits to the clinics had received instructions on how to treat their nets after using the discount vouchers to purchase nets.

purchase nets. Only a small percentage (7.0%) of the mothers mentioned that they did not receive instructions from the reproductive and child health clinics on how to treat the nets they had bought through the National Voucher Scheme. About the entitlement of free deltarmethrine treatment kits for net re-treatment in subsequent months the data show that 54.2% had received the information while 45.8% of the pregnant mothers were not informed.

Regarding the timing for free re-treatment kits of deltarmethrine, 75.0% of the pregnant mothers on subsequent visits and who had received discount vouchers, mentioned that the kits are provided at the time the baby is sent to the clinic for its third DPT-HB vaccine, and the remaining free treatment kit is issued when the baby is taken to the clinic for its measles vaccine at nine months of age. Less than a quarter (20.2%) of the pregnant mothers did not remember when the free re-treatment kits for their nets would be given.

In assessing utilization of ITNs, 88.3% of the pregnant mothers mentioned sleeping under their bed nets regularly. Only a small percentage (7.8%) of the mothers did not consistently use their ITNs.

Regarding pregnant mothers who had received discount vouchers but had not yet bought the intended nets and insecticide treatment kits, the data show that 68.8% of them said they did not have the top up money for buying a net. The rest of the mothers gave

mixed responses such as laziness and others promising to go and buy nets when they had left the clinics.

Participation of Reproductive and Child Health staff and their views towards implementation of the National Discount Voucher Scheme for ITNs.

A total of 8 RCH staff (2 from each health facility) were asked through in-depth interviews to give their views on the implementation of the scheme. Of the 8 RCH staff interviewed, 7 stated that the main purpose of the national discount voucher scheme was to provide a top up mechanism for the purchase of bed nets by pregnant mothers. The remaining (1) RCH staff associated the scheme with malaria prevention and reduction of maternal mortality and morbidity. Almost all RCH staff (7/8) could accommodate the discount voucher scheme activities in their routine work schedules. Remaining (1/8) of the RCH staff thought the scheme was an additional work load. The discount vouchers were properly stored in only 37.5% of the responses in respective RCH clinics. Measures for voucher safety outside the clinic were employed in only 25% of the responses. The RCH staff observed absence of proper entries of the discount vouchers in 37.5% of their assessments.

Half of the RCH staff (4/8) reported that discount voucher shortages were immediately reported to the malaria control coordinator in the DMO's office. However 2/8 of the RCH staff observed long delays in the process of getting new consignments as reported

by these staff, "*We place requests when we have at least one Discount Voucher Book remaining in stock because our attendances are moderate. But you will never get Discount Voucher Books on the day of making your request. There is delay. It takes as long as two weeks to one month from time of making your requests to getting your next consignment of discount vouchers. Sometimes the clinic goes without discount vouchers for up to two or three weeks. You see we made our request for Discount Voucher books on 24/6/2005 but to date 28/6/2005 no signs of response from the DMO's office. We have to ask the mothers to remind us of their discount vouchers on their next visits, one staff complained.*

Some RCH staff (3/8) observed a weakness in the national discount voucher for not recognizing postnatal mothers as beneficiaries of the scheme if they did not receive discount vouchers when they were pregnant. A quarter (2/8) of the RCH staff sited the long periods of shortage (5 months) of NGAO insecticide re-treatment kits given during the third DPT-HB and measles vaccines. Another (2/8) of the RCH staff interviewed said the subsidy given through discount vouchers for ITNs was not enough for some pregnant mothers coming from poor families. More than half (5/8) of the RCH staff observed commitment to storing of the discount voucher books after receipt from the District Medical Officer, while it is only (3/8) who took efforts to make entries and recording of receipts and issues. In cases where the staff forgets to issue discount voucher to eligible mothers, half of the RCH staff (4/8) planned to issue the forgotten vouchers to targeted mothers when they came back on their subsequent visits to the

clinics. A quarter (2/8) of the RCH staff made use of village health workers to make follow-up of mothers who left the Antenatal clinics without being issued intended discount vouchers. The remaining quarter (2/8) of the RCH staff decided to reserve unissued discount vouchers when targeted pregnant mothers had left the clinics without being provided with the latter.

Management issues of the national discount voucher scheme, procurement and distribution to Reproductive and Child Health Clinics.

The DMO reported that, discount vouchers are printed and bought by MEDA who supplies them to the office of the District Medical Officer for distribution to Reproductive and Child Health Clinics. The CHMT is doing the monitoring but there have been problems in the operation as stated by the DMO.

"When discount vouchers are out of stock it takes a long time to get another supply. Delay lasts up to two weeks. Presently there are three clinics without discount vouchers. Deltarmethrine Insecticide re-treatment kits were issued by UNICEF during the pilot study in previous years but there has been a delay with the national discount scheme until end of last April, 2005. The District Council tried to buy some kits but the exercise could not be maintained. In some rural areas it takes the mothers a long time to buy their nets after receiving the discount vouchers because of failure to get the topping up money early. Others remain with the vouchers without buying the intended nets until they come back for delivery".

On receipt of the discount vouchers at the DMO's office from MEDA they are recorded in a ledger book, issues to the RCH clinics are done through issue vouchers. The pregnant mothers are registered and numbers of discount vouchers issued are recorded at the top of their Antenatal cards. The RCH staffs have no chance to make any tricks with the voucher because they are not allowed to make any monetary transactions as it was the case during the pilot study.

Net sellers are recruited and monitored by MEDA while the CHMT mobilizes the community to participate in the scheme.

When the DMO was asked on how the present operation of the scheme could be improved he said, *"Rectification need to be done with the regularity of the supply of Insecticide re-treatment kits for nets. Mobilization should continue especially with the sensitization of males who are the decision makers on whether money should be used or not for the purchase of a bed net. Mothers who are unable to get the topping up money should be provided with free bed nets and the discount voucher scheme should be widened to cover underfives, the old and orphans".*

Participation of net sellers in the provision of nets to eligible mothers in the national discount voucher scheme.

A total of 6 net sellers were visited and interviewed. Almost all net sellers (7/8) engaged in the scheme bought their nets from wholesalers in the city of Dar-es-Salaam. The remaining (1/8) had their nets supplied by PSI unless there was a breakdown of communication. Transportation costs among the net sellers varied from an average of Tsh. 2,500/= to Tsh.6,400/=. Retail net prices through the voucher scheme also varied between Tsh.2,300/= and Tsh.5,000/=. Whole sale prices varied between Tsh. 1,800/= and Tsh.3,500/=. The prices at individual shops for each category of bed net remained fixed in 5/6 of the net sellers, while 1/6 reported (price) variations. All net sellers issued nets to mothers after receiving both the discount vouchers and the topping up money. 1/6 of the net sellers accepted the discount voucher for topping up at an installment basis. A few net sellers (1/6) instructed the mothers to use 350ml and 700ml for dilution of the insecticide for respective net treatment. Remaining majority (5/6) expressed wide range of variations (250ml-1000ml) on the volumes of insecticide dilution for the different sizes of bed nets. This is against the standard dilutions of 350 ml. of water for nets categorized as small/medium size and 700 ml. for nets categorized as large, 4½ x 6 feet and 6 x 6 feet respectively.

CHAPTER 5

DISCUSSION:

The Ministry of Health Tanzania, through the National Malaria Control Programme introduced the discount voucher scheme for ITNs purchase by pregnant mothers so as to improve coverage of ITNs use in pregnancy. This study examined the socio-economic and cultural factors that might influence receipt and uptake of ITNs by pregnant mothers under the National Discount voucher scheme in Kibaha district.

Awareness of malaria as a health problem to pregnant mothers and available control measures

Majority of the mothers were aware that malaria and anaemia are major health problems in pregnancy and held the notion that they were at risk of getting malaria and anaemia. In pregnancy such a high degree of awareness and risk perception would potentially influence the mothers to buy nets (Guyatt et al, 2004)

This high level of awareness might have been adopted through the news media following frequent announcements in the fight against malaria. The district has also been through various malaria control projects where awareness campaigns have been a component. CARE International and other NGOs have been implementing malaria control programs in the district prior to scheme.

Awareness of mosquitoes as malaria vectors and their control.

Awareness of mosquitoes as malaria vectors was very high hence the reason for more than three quarters of the mothers reporting use of nets for malaria control. There is a general awareness that mosquitoes are abundant during and after the rain season indicating that use of nets may only be emphasized during this season, with the possibility of not using nets in the hot dry seasons. This is the picture in the coastal belt where the community holds the view that mosquitoes and associated fevers are common in the rain and rice harvesting seasons (Winch et al., 1994).

Household net use, perceived efficacy and safety of ITNs

The reported net use by pregnant mothers was very high indicating that advocacy for net use have been well received. Thus, ITNs were perceived by the absolute majority of the mothers to have the ability to kill mosquitoes. Such positive perception would potentially motivate mothers to use ITNs in pregnancy, given that more than three quarters (82.1%) believed that the insecticide used was safe. However IEC for the programme need to be continued since there is still a small percentage (11.3%) of the mothers who think the deltarmethrine used for net treatment is not safe. The fact that a highly significant proportion of mothers who had already received discount vouchers (mothers on subsequent antenatal visits) reported sleeping under a net may conceivably serve a proxy to validate net acquisition through the discount voucher scheme. Thus, mothers who had received a voucher were highly likely to pay the top up money for the

purchase of a net indicating a great success of the discount voucher scheme for ITNs purchased by pregnant mothers in Kibaha.

Awareness on the discount voucher scheme for ITNs to be purchased by pregnant mothers.

Pregnant mothers were well aware of the national discount voucher scheme. This might be explained by the awareness campaigns going on throughout the country. Awareness campaigns in the study area had already started under a pilot study for the discount voucher, a project run by CARE International. However a more positive response may be expected with the national scheme because of the relatively bigger subsidy (2,750/=) for ITNs compared to that which was offered during the pilot study (TShs2,500/=). The high degree of awareness indicates that the programme has great potentials to be effective for ITNs coverage in pregnancy.

Acquisition of discount vouchers by pregnant mothers on their first visit and net purchase.

Generally there were no barriers for the receipt of vouchers as around three quarters of the mothers reported to have received a voucher. However there were differences in information provision about entitlement to a subsequent free deltarmethrine kit as only about a half (56.5%) of the mothers had received the information. Instruction for net treatment was on the average well received as more than two thirds of the mothers had received correct instructions. There were no barriers to physical access to net sellers as

the absolute majority (90.0%) had been directed to the nearest net seller. The fact that around two thirds of the mothers reported that they would pay the top up money the soonest indicates willingness to pay the top up money. It is clear that the success of the discount voucher scheme would depend on willingness and ability to pay the top up money, physical accessibility to net sellers as well as constant ITNs use and re-treatment (von Eijik et al., 2004).

Acquisition of discount vouchers and net purchase by mothers on subsequent antenatal visits

There were no barriers as to the issuance and receipt of vouchers as the majority (82.5%) of the mothers on there subsequent antenatal visits had received the vouchers, three quarters of whom reported to have had already bought the nets indicating a very high coverage. This coverage is higher than the 23.0% coverage previously observed in Kilombero district perhaps because the subsidy of Tsh.2750/= for the nets under the National Discount Voucher Scheme is about six times the subsidy of Tsh.500/= for the nets supplied in Kilombero (Mushi et al., 2003). Information provision about receipt of free insecticide treatment kit and instruction on net treatment were similar as for mothers on their first visit. .

Operationilazation of the discount voucher scheme under the RCH staff the DMO and Net sellers

There was an unanimous understanding by the RCH staff that the voucher was a subsidy for nets to be purchased by pregnant women and they observed that the scheme was not an additional work load implying a smooth operation. The operationalization of the scheme however seems to face potential and actual barriers in implementation, in terms of storage, issuance and safety of vouchers outside the clinic, as well as shortage of vouchers as echoed by the DMO who observed a delay of up to two weeks to procure supplies of vouchers. Inability to pay the top up money as a potential or actual barrier to implementation of the scheme, thus one mother who received a voucher in January 2005 had until May 9th 2005 not been able to pay the top up money (Tanzanian Daima, 09.05.2005). Involvement of all stakeholders especially the male partner who makes decisions for house hold expenditure may alleviate the barrier. This can be achieved through enhanced national advocacy. There were no barriers to the retail net sellers for the procurement of nets from wholesalers, issuance of nets after receiving top up money and redemption of vouchers indicating that the programme is effectively being implemented. One major barrier observed at net delivery end point is the variability in instructions for deltarmethrine dilution upon issuance of nets which have great potentiality for incorrect dilutions. Clearly correct dilutions for deltarmethrine as the cornerstone for ITNs to be efficacious for mosquito control (MOH, 2002). Clearly, the deployment of nets that retain the insecticide for a long period (3 to 5 years) would certainly improve the effectiveness of ITNs use in pregnancy.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS:

6.1 CONCLUSIONS:

(i) Awareness to the national discount voucher scheme by pregnant mothers is very high

(ii) Awareness of malaria as a health problem to pregnant mothers is very high amongst the mothers.

(iii) Pregnant mothers are highly aware of the effectiveness of ITNs and they regard the insecticide to be safe.

(iv) The study has shown that pregnant mothers on their subsequent visits sleeping under bet nets comprise 88.3%.

(v) Mothers on their first visit to the RCH clinics receiving discount vouchers for ITNs comprise 72.0%.

(vi) Shortage of discount vouchers and deltarmethrine insecticide for net re-treatment is a barrier to the implementation of the national discount voucher scheme for ITNs.

(vii) Top up costs for the purchase of ITNs is a barrier to the acquisition of ITNs to some pregnant mothers.

(viii) The national discount voucher scheme does not recognize postnatal mothers who have not received discount vouchers during pregnancy.

(ix) There is variation of instructions on insecticide dilution for net treatment by net sellers.

6.2 RECOMMENDATIONS:

The national discount voucher scheme is popular amongst the pregnant mothers. So long as the supply of discount vouchers and NGAO insecticide kits is kept regular at the RCH clinics coverage of ITNs is going to be even better. However:

(i) Mechanism of supplying discount vouchers and deltarmethrine kits to DMOS need to be reviewed to avoid shortages..

(ii) Exemption mechanism needs to be designed to identify mothers who cannot manage the top up costs for ITNs.

(iii) The scope of the scheme has to be widened to include another high-risk group the underfive years old.

(iv) Mechanisms have to be designed early enough to sustain the programme after donor withdrawal.

(v) Efforts need to be made to control the retail prices for nets so that they are uniform at all exit points.

(vi) Organize regular refresher meetings for RCH staff and net sellers to review their obligations.

(vii) Design a mechanism for follow up of pregnant mothers who did not collect their discount vouchers at the RCH clinics on previous visits.

(viii) Recommend future study for a home based survey to asses actual bed net use by pregnant mothers.

(ix) Mechanism need to be instituted such that every pregnant mother coming to the clinic gets information on Insecticide provision and net treatment.

(x) Guidelines should be designed for the RCH staff reinforcing security for discount vouchers within and outside the health facilities.

(xi) Husbands should be recognized and involved as important partners for the success of the scheme.

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