ADDIS ABABA UNIVERSITY

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Assessment of Effectiveness of Insecticide Treated Bednets for Malaria Prevention in Under-five Children of Aletawondo Woreda, Southern Ethiopia

By

Eshetu Wassie (MD)

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Dedication

This paper is dedicated to my beloved wife, Hanna Aleligne and our kid, Samuel Eshetu.

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Abstract

Background: A Meta analysis of all randomized controlled trials showed that insecticide treated net use has an overall protective efficacy against all -causes of child mortality and malaria disease episodes of 18% and 50%, respectively. Frequent washing, lack of retreatment, inconsistent use, other social and technical factors were shown to influence efficacy of bednets at field trials. To date, however, experience with local factors influencing the effectiveness of ITN programs remains very limited and it is not known whether the impact of treated nets in the context of well controlled randomized trials can be replicated under program conditions in all set-ups.

Objective: To assess the effectiveness and influencing factors of ITNs in preventing clinical malaria in under five children in Aletawondo Woreda, Sidama Zone, SNNPR.

Methods: A community based retrospective cohort study was conducted on a sample of 342 under five children (171 exposed and 171 unexposed/comparison group) residing in Chucko Town & surrounding rural kebeles where there was ITN distribution. A precoded, pretested structured questionnaire was employed to obtain the necessary information after getting both written and verbal consent from the concerned bodies. The collected data was daily checked for completeness and consistency and it was entered into computer database. An internal comparison was also conducted to assess factors influencing effectiveness of bednets among those with history of malaria (cases) and without history of the disease within the exposed cohort. Other appropriate statistical tests were done and interpretations were made accordingly.

Result: The history of malaria attack from September to December 2004 among reported regular ***ITNs*** users was 43.5% less than in those who didn't use/own bednet. This was statistically significant (OR=0.565 95%CI 0.346-0.925 p=0.023). The household factors that were found to influence the effectiveness of ITNs were large family size, keeping livestock inside living room, using a bednet obtained a year or more, absence of retreatment of the bednet for more than 12 months, presence of hole/tears in the bednet, frequently washing the bednet and reported history of rolling out of the child from the bednet during night time.

Conclusions & Recommendations: Despite lots of programmatic deficiencies, ITNs are effective in preventing clinical malaria in under-five children. Based on these, appropriate recommendations are forwarded.

Key Words: (**Clinical malaria, Under -five child, Insecticide treated mosquito net use, Effectiveness, retrospective cohort, nested case control Design, Influencing household factor**)

Chapter 1 Introduction

1.1 Background

Despite several years of research and concerted efforts at control, the realization of a malaria-free world remains a dream. The prevalence of the disease continues to increase and is re-emerging in many parts of the world. It is one of the leading causes of morbidity and mortality, mostly in the developing countries. Yet, much of the impacts of malaria would have been averted by the currently available tools. These tools are use of insecticide treated nets (ITNs) by under -five children and pregnant women; intermittent preventive treatment of pregnant women with effective antimalarial; prompt access to combined antimalarial treatment of cases within 24 hours of diagnosis; and prevention & control of epidemics by using an early warning system. The 2000 Abuja Summit has set at least 60% coverage for each of these interventions by the year 2005 (1-5).

In Ethiopia, malaria is a major public health problem, where about 75% of its total area is malarious and nearly 65% of its population is at risk (6). In a recent report from Ministry of Health of Ethiopia, an estimated 220 districts are classified as being malarious with transmission period of six and above months per year and an estimated 33 million population or 6.6 million household reside in these districts(7). High transmission usually occurs at altitudes below 2000 meters above sea level and the two main seasons for such transmissions are September to December (after the heavy rains) and March to May (following the light rains). The two major malaria parasites in the country are *Plasmodium falciparum* (60%) and *Plasmodium vivax* (40%) (6, 7). The National Malaria Prevention and Control approach in Ethiopia employs four main strategies as described above. These include early diagnosis and prompt treatment,

selective vector control including the use of ITNs and indoor residual house spraying (IRS), early detection and control of malaria epidemics and prevention of malaria during pregnancy (7).

Although there is a very good experience in malaria vector control through IRS, historically the use of ITNs in Ethiopia has been limited (7). In Ethiopia, distribution of ITNs through the healthcare delivery system was first introduced in returnee and resettlement sites in the Western part of the Tigray Region in 1997 through a cost recovery scheme. In 1997-1998, ITNs were also distributed in Oromia, Amhara and Southern Nations, Nationalities, Peoples (SNNP) regional states with support of the WHO and Italian Co-operation (7). A total of 45,000 ITNs were distributed in this early phase. It can be assumed that most of these nets have completed their useful life and no longer form part of the "standing crop" of ITNs in Ethiopia. Following these small scale ITNs distributions, in 2000-2003 UNICEF donated a total of 1.42 million ITNs. As of January 2004, approximately 950,000 ITNs have been delivered to the regions and of these, just over 700,000(75%) were distributed to households. A total of 4 million ITNs are required to achieve the Abuja target of 60% ITN coverage among vulnerable groups in target areas (7).

The National Strategic Plan for Scaling -up coverage and use of ITNs in Ethiopia is designed to guide national malaria prevention and control efforts to achieve coverage of 60%(not only ITNs, includes appropriate combinations of personal and communal protection, including ITNs and IRS) of target districts by the end of the year 2007 through concerted efforts as it has been impossible to meet the Abuja target of 60% by 2005 (7). According to a personal communication with Mr Seife Bashaye at Federal

Ministry of Health, the 2004/2005 ITN coverage of households in the malarious areas of the country is 7.5% when two ITNs per household are considered and 15% for one ITN per household (8)

1.2 Problem Statement

About 40% of the world's population lives in countries at risk of malaria (1). Of the estimated annual 300–500 million clinical malaria cases and 1.5–2.7 million deaths that are directly attributable to malaria, more than 90% of them occur in sub Saharan Africa (SSA), mostly in under- five children (1-3). For instance, in this region, where the health services accessibility and resources are still limited, 30% to 50% of the out-patient under five clinic visit is due to malaria (4). Moreover, in SSA region, the malaria parasite *Plasmodium falciparum* accounts for at least 25% of all childhood mortality below 5 years of age, excluding neonatal mortality (1, 5).

In Ethiopia, malaria is a major public health problem where about three-fourth of its total area is malarious and nearly two-third of its population at risk. In the country, malaria transmission is seasonal and depends on altitude and rainfall patterns (6,7). In the Southern Nations, Nationalities and Peoples' Region (SNNPR), about one third of outpatient visits and 10% of hospital admissions are directly attributed to malaria (9). According to 1996 E.C. activity report of Chucko Health Center, about 50% of under-five visits during highest transmission seasons (September- December)were due to malaria and the annual average was 45%(10).

To cope with the problem, two of the major malaria prevention & control strategies have been early diagnosis & prompt treatment of cases and indoor house spraying with

DDT. However, these two strategies are currently in danger. On one hand, there has been increased drug resistance (for both chloroquine & sulphadoxine-pyrimethamine) (11, 12) and on the other hand there are increased pressures to ban dichlorodiphenyltrichloroethane (DDT) use from the surface of the earth for its bioaccumulation effects (13). Thanks to the technology, hopes for controlling malaria and its health consequences have recently been revitalized by the demonstration that nets treated with insecticide (ITNs) can reduce morbidity and mortality. The growing bodies of evidences from field trials revealed that ITN use substantially decreases the frequency and severity of clinical episodes of malaria (14). A Meta analysis of all randomized controlled trials showed an overall protective efficacy against all -causes of child mortality and malaria disease episodes of 18% and 50%, respectively (15-17). ITNs have since become integrated part of the global malaria control strategy (18). Following the Abuja Summit of 2000 with its highly ambitious target for expanding ITN use to 60% of the people at risk(under five children and pregnant women) by 2005 (4,19-21) , large scale implementation of programs to supply treated nets has been underway in several African countries including Ethiopia. To date, however, experience with local factors influencing the effectiveness and sustainability of ITN programs remains very limited (17-18, 22-24) and it is not known whether the impact of treated nets in the context of well controlled randomized trials can be replicated under program conditions (18, 24-26).

In Sidama Zone (Chucko Town & nearby rural kebeles ,Aletawondo Woreda) where the current study has been conducted and other parts of Southern Region, net distribution has been underway since September -October 2002 at subsidized costs, but their

effectiveness and related factors are not known at the community level (27). Thus, this study aims to assess the program effectiveness of ITNs for preventing malaria in under five children in Chucko Town & neighboring rural kebeles, Aletawondo Woreda, Sidama Zone. It also tries to address the most important factors determining effectiveness of ITNs at household levels.

1.3 Literature Review

1.3.1 Brief History of ITNs

Bed nets, a very old method of reducing contact between man and vector, may have been used in the Middle East as early as the 6th century BC (28). However, applying residual insecticide to fabrics to prevent vector-borne diseases such as malaria and leishmaniasis began during World War II, when the Soviet, German, and US forces used insecticide-impregnated nets and clothing (15-16). In Africa, bed net use seems to be traditionally higher in West Africa, especially in The Gambia, than in East Africa and higher in cities than in rural areas (5, 29-31).

The ITN studies conducted in the late 1970s demonstrated the safety of synthetic pyrethroids and the significant impact of ITNs on various entomological parameters. These studies also helped to define the action mechanism for ITNs (repelling and killing of mosquitoes) and optimal dosages for various combinations of netting and insecticide.

In the 1980s, ITNs were put through a series of successive testing phases, comparable to the development of other health interventions (5, 15-16, 32). Since the groundbreaking research of Bradley and Greenwood in The Gambia (33), and the 1991 report of Alonso and his colleagues (34), which showed a significant inverse correlation between ITN usage and mortality, much hope has been pinned on the use of ITNs in malaria control. These prompted the World Health Organization to fund further trials in different epidemiological and cultural settings (23, 35-37).

1.3.2 Efficacy of ITNs on Morbidity due to Malaria

Many trials of ITNs both on child morbidity and mortality were conducted in the world's most malarious regions particularly in Sub Saharan African countries such as The Gambia, Tanzania, Kenya, Burkina Faso and Mali (14-17). Systematic review of trials on morbidity and mortality were done regularly by Lengeler C and others. Review of trials on morbidity impact of ITNs in areas with stable malaria revealed that ITNs reduced the incidence of uncomplicated malarial episodes by 50% compared to no nets, and 39% compared to untreated nets. In areas of unstable malaria, ITNs did so by 62% compared to no nets and 43% compared to untreated nets for *Plasmodium falciparum* episodes (17). It also reduced the episodes of uncomplicated *Plasmodium vivax* by 52% compared to no nets and 11% compared to untreated nets. When compared to no nets and in areas of stable malaria, ITNs also had an important impact on the reduction of severe malaria (45% protective efficacy, 95% Confidence Interval (CI) 20 to 63), parasite prevalence

(13% protective efficacy), high parasitaemia (29% protective efficacy), and splenomegaly (30% protective efficacy)(17). ITNs use also improved the average hemoglobin level in children by 1.7% packed cell volume. ITNs also have a significant impact on mortality. It was concluded that ITNs are highly efficacious in reducing childhood mortality and morbidity from malaria, but field issues for widespread use remain to be answered (15-17).

Very few studies were conducted to evaluate the effectiveness of large scale (village wide) use of ITNs. A social marketing ITN program in 18 villages in the Kilombero and Ulanga districts of southwestern Tanzania have been reported to be effective in reducing malaria morbidity in under two children (38). In a recent study regarding the effectiveness of ITNs compared to other preventive methods, it was found that sleeping under a treated bed net reduced the risk of infection by 63% (58-68%) (39). In Tanzania, regional projects such as Kilombero Valley treated net programme (KINET) are reported to be highly successful in reducing malaria related morbidity and mortality (14,40).

1.3.3 Factors Influencing Efficacy of ITNs

Not all mosquito nets owned by African households are being used for young children (41-42). Adherence, defined as the proper use of ITNs by children, is influenced by a range of environmental, technical, social and behavioral factors (22-23, 43). Some of the environmental reasons given for not regularly and properly using ITNs are absence of mosquito nuisance (22-23, 37, 43-50) and hot weather (22, 42). The social and behavioral reasons reported were frequent change in sleeping places and sleeping patterns (22, 51). Some of the technical reasons were absence of proper place to hang the net, rolling of

the child out of the net; the tear of the nets, small size of the nets, etc (22, 43). It is not also uncommon for nets to be totally left unused by anybody especially when given freely (42). In those regularly using their nets, significant proportions of them were not properly using their nets when assessed by direct observation (43, 52). The root causes for the above reasons were postulated by the researchers but the exact reasons are not known (23, 41).

Another most important factor affecting net effectiveness is the issue of regular re-treatment with insecticide. As most nets currently in use don't have an insecticide incorporated directly in to the fibers, retreatment every 6-12 months should be done depending on the type of insecticide used and the local pattern of malaria transmission. The insecticide is effective for 6-12 months provided the ITNs are not washed during that period (18, 22, 43, 46). Washing, as stated above, is also an important determinant of insecticide longevity in the field and if done before the recommended time for various reasons can greatly reduce the effectiveness of the insecticide (18, 22, 43). Lack of replacing the net could also lead to loss of the efficacy of the net. Trials undertaken to provide some essential field information on ITNs within the site of an extended ITN programme in the Morogoro Region of Tanzania found that 45% of all nets were in bad condition (defined as more than seven large holes). It is concluded that an effective ‘life’ for polyester nets is 2–3 years (18).

Chapter 2 Research Questions & Objectives

2.1 Research Questions

With this body of facts, this particular research project strived to address the following two major questions:

1. Are ITNs really effective for preventing clinical malaria in under five children when used under program conditions in the Ethiopian context?
2. What major household factors determine their effectiveness for combating malaria under program conditions?

2.2 Objective

2.2.1 General Objective

To assess the effectiveness and influencing factors of ITNs for preventing clinical malaria in under-five children of Chucko Town & nearby rural kebeles, Aletawondo Woreda, Sidama Zone ,SNNPR

2.2.2 Specific Objectives

- Compare the history of malaria attack between ITN users and non-users
- Determine the major household factors influencing the effectiveness of ITNs for preventing malaria in those under- five children who use ITN

Chapter 3 Methods

Study Site, Facilities & Period

This study was conducted in catchment areas of Chucko Health Center in Aletawondo Woreda, Sidama Zone, SNNPR from January 17- February 4, 2005.

- ***Woreda Description***

Aletawondo Woreda (District) is one of the Woredas in Sidama Zone. The capital of the Woreda is Wondo Town. Wondo is located 65 kms from Awassa (Capital of Sidama Zone and SNNPR), 12 km from the asphalt road (highway from Addis Ababa to Moyale) and 338 km south of Addis Ababa. Concerning the climate of the Woreda, 11.8% is *Dega*, temperate (>2500 meter above sea level), 71.3% is *Woinadega* (1500-2500m above sea level) and 16.9% is *Qola*, tropical (<1500 m above sea level). Currently functioning health facilities in the Woreda are two government health centers, five government health stations, three mission clinics, two private clinics, four government health posts, three private drug shops and 16 private rural drug vendors. The health centers are at least staffed by a health officer, nurses, laboratory technician, a sanitarian and health assistants. The clinics and health posts are staffed by either a nurse or a health assistant or both. These clinics & health posts don't give laboratory services. Mission clinics, which also provide laboratory diagnostic services, are run by at least two nurses and a laboratory technician. Except in the two health centers, Dengora Catholic Mission Clinic and the private clinic (Wondo town), there are no water and electricity facilities in

the health posts and health stations. Digital telephone service is found in the Woreda Health Office, Aletawondo Health Center and recently in Chucko Health center. Television transmission service is present in Wondo & Chucko towns. There is no vehicle in health stations and health posts except in health centers and Dengora Clinic .The total population of the Woreda, which resides in five urban and 57 rural kebeles, is 337, 825 of which 173, 203(51.27%) and 164,622(48.73%) are males and females, respectively. Of the total population, 18.87% % and 3% respectively constitute under five children and pregnant women. The majority of the population is *Sidama* and *Sidamgna* is the mother tongue for most people. Most of the population is Christian by religion (53).

- ***Description of Specific Study Site***

The specific study area was Chucko Town & surrounding rural kebeles of Aletawondo Woreda, Sidama Zone, SNNPR. Chucko Town is 335 km south of Addis Ababa on the highway to Moyale. It is about 60km southeast of regional capital, Awassa. In the town, there is one Health Center. The total catchment population of the Health Center is 84,175 which comprises of 7,346(8.7%) urban &76,829(91.3%)) rural dwellers. The male and female population constituted about 43,599(51.8%) and 40,576(48.2%), respectively. The population lives in eleven rural and one urban (Chucko Town) kebeles. The rural kebeles are Chucko Lamela, Mangudo, Korke, Gure, Rufo Waene, Rufo Chancho, Gambella, Tesso, Dibicha, Mekela and Debeka. Korke (9,538 population) followed by Mangudo (8,149 population) are the kebeles with highest population size. There is one functional health post in each of Korke, Gure, Tesso and Dibicha rural

kebeles. In the rest of the kebeles, the health post is either under construction or non-functional for various reasons. The estimated number of households is 17, 536(4.8 person/household). About 3,586 (4.26%), 9,411(11.18%), and 15,245(18.11%) constituted under-one, under-three and under-five children. The estimated number of women in childbearing age (15-49 years of old) is about 16,414(19.5%) and the pregnant women are projected to be about 3,585 (4.26%) of the total population. There is a 24-hour electric service & automatic telephone service for Chucko Town. In the rural catchment kebeles, neither of the services is present.

- ***Distribution of ITNs in the Area***

Chucko Health Center started distribution of ITNs on 11/2/95 E.C (October 21, 2002). In 1995 E.C (2002/03), 531 ITNs were distributed to families of Chucko Town who had under-five children &/or pregnant women. In the following year (1996 E.C/2003/04), 423 ITNs were distributed to Chucko Town families for 18 Birr/ITN by the Health Center. From Yekatit 1996 E.C (Feb 2004) to Sene 1996 E.C (June 2004), 1046 ITNs were freely distributed to families of elementary school children. Two ITNs for each family were distributed for free by Mekane-Yesus (508 ITNs), Kale Hiwot (500 ITNs) and Muluwongel (38 ITNs) Elementary Schools. All these bednets were treated with permethrin by the trained health workers from Chucko Health Center. So, a total of 2000 ITNs(954 ITNs by Chucko Health Center & 1046 by the elementary schools) were distributed over the two years .The students of these elementary schools were both from Chucko Town(majority) and nearby rural areas. Only 31 rural children were given ITNs

(10). All the ITNs were given immediately treated with permethrin by health workers of the health center.

Study Design

It was a *retrospective cohort* study. Epidemiological studies using cohort designs when the exposure level of the population is expected to be low are highly recommended to study the outcome of the exposure. Retrospective (historical) cohort is more appropriate when there is a resource constraint including time, and when a reliable record is available about the exposure status of the population. The other justification for using this design was that when the incidence of the disease is expected to be low and time-taking for accumulation of adequate outcomes, historical cohort is appropriate when compared to prospective cohort. So, retrospective cohort was selected for two practical reasons:

- The ITN coverage for rural areas in Aletawondo Woreda as a whole was very low (*rare exposure*) .On the other hand, almost all the cases that were seen during pilot study were from rural areas where ITN use (exposure) was very rare.
- There was a resource constraint (time & money) to passively detect cases as the study was to be conducted in January after the passage of the transmission period. So, it was very difficult to get new malaria cases. It can take 21/2 months to get 110 cases (the initial sample for case-control design). This would be very impractical from feasibility point of view. In the presence of rare exposure, case-

control design will be inappropriate. In the presence of low prevalent cases (mainly in urban areas) and very low ITN coverage (rural areas), both cross-sectional & case-control designs are inappropriate. The other justification why cross-sectional study was not conducted was that the objective of the study was to assess effectiveness. So, in the absence of baseline data, it would be very difficult to evaluate outcome of a health service programme with a one -time affair (i.e. cross-sectionally).

Ascertaining exposure status was done from multiple sources of information in a stepwise manner. Initially, the net ownership was ascertained from the records of Chucko Health Center and Mekane Yesus, Kale Hiwot & Muluwongel Elementary Schools in Chucko Town since these organizations were the major distributors of ITNs. A rapid census of nets in households and their date of purchase were carried out to trace back all the nets including those obtained outside the Health Center and the Schools. For each exposed member of the cohort, an unexposed cohort with similar age group (6-59 months) & place of residence (urban/rural) was selected as a comparison group. The exposed cohort consisted of children of 6-59 months of age, who have been regularly using insecticide treated ITN since the Ethiopian New Year, with the ITN obtained from Chucko Health Center or the elementary schools or shops with clear insecticide treatment information. All the controls were selected when they were found that they were not using an ITN at the time when the exposed members were using a net. I.e. has no ITN or never used an ITN during the high transmission seasons (September to December). The entire cohort had been free of malaria for the first week following the New Year. Then, the cohort was assessed for the history of malaria within the last four months (September to December

which is high transmission season). An internal comparison was done to assess the factors that can influence effectiveness of insecticide treated nets within the exposed cohort. In summary, the following criteria were used for identifying the cohorts:

Inclusion criteria for exposed were

- Under -five children from 6 -59 completed months on at the day of the census
- Had obtained the ITN before the Ethiopian New Year (September 11, 2004) to enhance the recall rate for the respondents .This New Year was taken as a date when the exposure has started for assessing the effect of exposure in the high transmission period.
- Have been regularly sleeping under an *insecticide treated mosquito net* for at least four months prior to data collection (including the New Year).
- Were healthy in the first seven days starting from the Ethiopian New Year (i.e. from September 11-17, 2004). The first seven days were taken by considering the incubation period of *P .falciparum.*
- Residents of the selected kebeles (Chucko Town, Chucko Lamela, Mangudo & Korke) for at least six months prior to data collection
- Those exposed groups who do not fulfill the inclusion criteria were excluded. Example those who reported irregular use of bed net, owning untreated bednet, ITN obtained after the New Year, etc were excluded from the sampling frame.

Inclusion criteria for comparison groups (Unexposed/ non-users of ITN)

- Under-five children with 6-59 completed months of age

- The unexposed group comprises under-five children in the Town and surrounding rural areas who didn't own ITN (haven't sleeping under a net) for at least four months (prior to the census) including the Ethiopian New Year. The child was healthy or hadn't any febrile illness suspected or diagnosed to be malaria for the first one week after the New Year.
- Were residents of the selected kebeles for at least 6 months prior to data collection
- Those households with under-five children who obtained the net and have started sleeping after the New Year were excluded from both unexposed and exposed groups.

Population and Sample

- ***Source population***

  It was under- five children of Chucko Town & surrounding rural kebeles included as catchments areas of Chucko Health Center, Aletawondo Woreda.

- ***Study population***

It constituted children from 6 to 59 completed months who fulfilled the inclusion criteria described above. I.e. Under-five children in Chucko Town, Chucko Lamela, Mangudo and Korke who fulfill the above criteria constituted the study population.

- ***Sample Size***

Assuming 45% malaria rate (i.e. outcome) among non-exposed (those who didn't use ITNs for the last four months)(8), 80% power, 95% confidence interval, a 5% alpha error, an odds ratio of 0.5(here the main exposure variable, ITN use, assumed to have a protective effect so that the risk ratio is ½ = 0.5) and an unexposed: exposed ratio of 1:1, 155 exposed and 155 unexposed cohorts (total 310 study subjects) constituted the initial sample. This sample was further adjusted using a non-response rate of 10% and the final sample was therefore 342(171 exposed and 171 unexposed group).

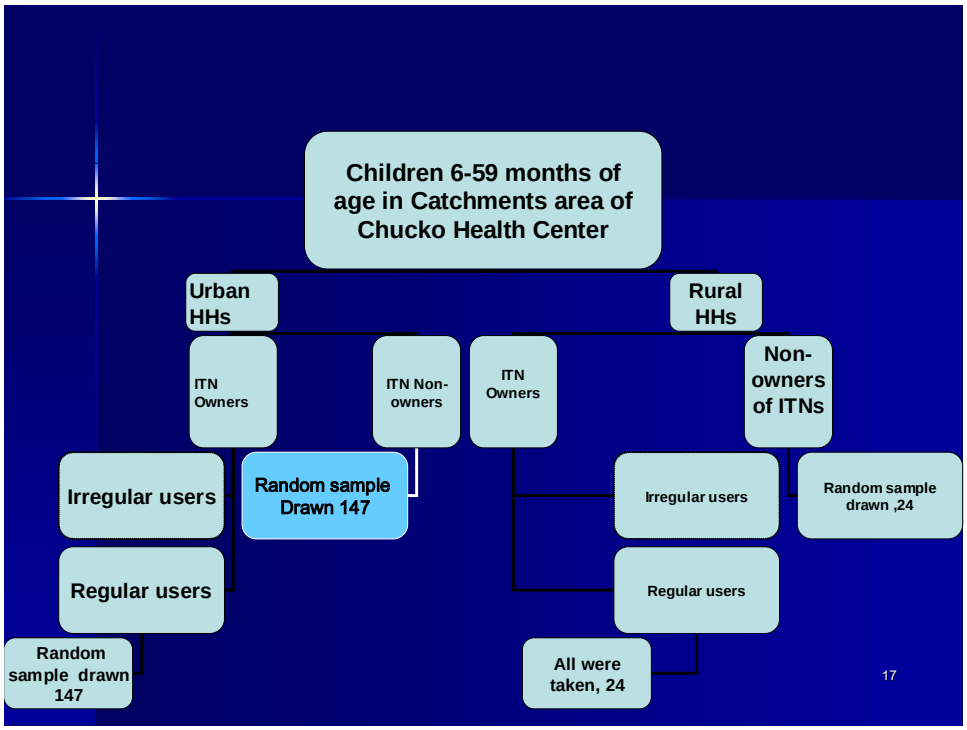
- ***Sample design***

Exposure status was ascertained basically from two sources: Initially from Chucko Health Center roster as it was the major distributor of the ITNs. The Health Center has list of the locations (*Kebele* and *Ketena),* names of heads of households who took the ITN, family size, number of under-five children & pregnant women, number and dates of nets purchased. The second reliable source of information for the number, date of ownership and family who owned the nets was the roster of *Mekaneyesus*, *Muluwongel* & *Kale-Hiwot* Elementary Schools in Chucko Town. This net ownership and nets that were obtained, by households,

outside from the Health Center and the School (e.g. purchased from shops) were further ascertained by conducting a census two days prior to data collection in the Town and selected rural kebeles (Chucko Lamela, Mangudo & Korke). During the census, mapping, house numbering and identification of all under-five children (both ITN users & non-users) who fulfilled the inclusion criteria described above were done. The house numbers & additional serial numbers were given and these two numbers were used to represent the Identification Numbers (Codes) of the eligible children to easily trace them during the actual data collection. Then, those children were classified as exposed and non-exposed. The sampling frame for each eligible cohort was prepared using random number list generator in EPI6. A random sample of exposed subjects was obtained using the random number list generator and for each exposed member drawn to be studied, an unexposed subject (comparison group) was randomly selected by the same computer programme from the sampling frame prepared for this cohort. When more than one under-five children who can fulfill the inclusion criteria were selected as study subjects in same household, the second drawn was dropped and another child was selected randomly to replace the second child. The identification of location of houses of children selected for the study (interview) was done one day prior to the actual data collection. All ITN users (exposed) in rural areas who fulfilled the inclusion criteria (age 6-59 months, regular use for the past four months, etc) were included in the study. From the 31 elementary school children of rural areas who were found to had taken ITNs from the schools, only 27 families of students from the surrounding rural areas were found to currently have under-five children in the age group of 6-59 months and of those, three under-five children were irregular users of ITNs. So, seven of the ITNs from rural areas were excluded from the sampling frame. Based on this, 24 net users were found eligible in

rural areas and included in the study. For 24 ITN users, 24 rural non-users were selected randomly in their respective kebele as comparison group from the sampling frame prepared for it. The rest 294 study children were selected from Chucko Town (147 ITN users & 147 non-users both of which were identified randomly using random number list as described above).

Fig. 1 Schematic Presentation of sampling steps



Data Collection

- ***Data collection method and instrument***

For each exposed (as defined below) and its comparable subject (unexposed), quantitative data were obtained using a pre-tested structured questionnaire prepared in English and then translated to Amharic, the working language for the Region. This was interviewer administered for mothers or caregivers of children at home. If there was no mother or usual caregiver, a second visit to the household was done. If still not found, any adult at the household was interviewed. If there was no adult in the household, another sample was drawn. For those who used an ITN, the condition of their nets including the size, shape, hanging place, holes, etc were observed during the interview using a checklist prepared by the principal investigator. Since there is no simple field tool to check insecticide content of nets (36), the records of the Health Center & the Elementary Schools as well as responses of the interviewee were considered to classify the ITNs as treated/ retreated or not. For those who reported to have experienced malaria in the study period and visited Chucko Health Center, their record at the health center were reviewed to compare the self-reported outcome with the health workers diagnosis (including laboratory). This was done using the Integrated Management of Childhood Illnesses (IMCI) record book which was recorded by a trained health officer and regularly checked by disease surveillance officers from World Health Organization Country Office.

- ***Data Collectors and Supervisors***

Following extensive training on the data collection instrument for two days, ten high-school graduates who can speak the local language and were community health agents for the catchments kebeles of Chucko Health Center conducted the census and the structured

interview for nine days under close supervision of the principal investigator, a nurse, health officer, sanitarian and three staff of the Awassa College of Health Sciences, Debub University.

- ***Data Quality Assurance***

The questionnaire was first prepared in English and was translated to *Amharic* by the principal investigator. The translated questionnaire was re-translated back to English .Then consistencies/agreements were assessed and adjustment measures were taken. The structured questionnaire were pre-tested on under five children in another Woreda (Awassa Zuria Woreda) using 10% of the sample size. This was conducted by the principal investigator and one high school graduate who was included as one of the actual data collectors, and the necessary modifications were done. Every day at the field, data were checked for completeness and consistency by supervisors. Questionnaires were sent back to the household and refilled in the presence of one of the respective supervisors to correct any incomplete and inconsistent responses.

Variables

- ***Independent****:* Socio-economic and demographic characteristics of the household as a whole and the child; knowledge , belief /perception, and practices related to malaria and mosquito avoidance, net ownership and use, net status (e.g. age of the ITN, source of ITN, re-treatment status, washing frequency, presence of holes, etc), perception about ITN and insecticide. The main independent/exposure variable here was net use by the child.

- ***Dependent/main outcome variable***: presence or absence of malaria morbidity in under- five children within the defined period of time (within the last four months i.e. September to December 2004).
- ***Operationalized variables***
  - *Confirmed Malaria Case:* an under-five child 6-59 months of age whose body temperature was greater than 37.5 ^{O}C, with or without complications and had a positive thin or thick blood film for *Plasmodium* parasite as examined by experienced laboratory technician. (Only taken when we were able to confirm it at the Health Center Record). The following definitions were based on history alone and obtained from the respondent or health center when the integrated management of childhood illness (IMCI) record put diagnosis as rule out malaria and given anti-malarial drugs.
  - *Probable malaria case:* A child with typical clinical signs of malaria (high grade fever, chills, headache, myalgia, arthlagia, etc lasting for at least 48 hours with or without complications) but with no laboratory confirmation. The child had been given antimalarials (either at home or prescribed at health institutions) and showed improvement. In addition, the child had to live in or recently visited a malarious area.
  - *Possible malaria case:* A child with fever lasting for at least 24 hours with few of the other signs and symptoms as well as given antimalarial at home or health institutions and showed improvement. In addition, the child had been living in or recently visited malarious area.
  - *Exposed (=Net use):* Most researchers consider a child to be a user when he /she had slept under an insecticide treated net the previous night (46). Any way, data on 'use during the preceding night' must be interpreted taking the survey season into account

(27). In this study, the use in the previous night, two weeks, one month and four months were considered. Here, we classified/defined the cohorts on the basis of regular ITN use for the previous four months starting Ethiopian New Year (September 11 2004). Those children with 6-59 months of age who owned insecticide treated bednets at that time and regularly used it since September and continued till end of December were considered to be exposed. Those who did not have ITN at that time as well as up to the day of census were considered to be unexposed and were selected as comparisons as long as they fulfilled the other inclusion criteria.

- ***Data Processing and Analysis***

Data were checked for completeness and consistency. Coded data were entered in to EPI INFO database and cleaning was done. Age of exposed and unexposed were analyzed by categorizing the age of children in to <12, 12 – 23, 24- 35, 36-47, & 48- 59 completed months. Outcome (history of malaria) was compared for the two groups taking the last four months. Proportions for socio-demographic characteristics and reported history of malaria in both cohorts as well as in cases and non-cases within net owners (exposed cohort) were calculated. Other descriptive summaries were calculated. Odds ratio with confidence intervals and p-values were also calculated for categorical variables (e.g. malaria in net users and nonusers; retreatment status in cases and controls). Stratification and logistic regressions tests to control confounding and assess major factors influencing ITNs effectiveness in net owning households (exposed cohort) were computed. Interpretations at $p<0.05$ using 95% confidence intervals were done for statistical significance. EPI-INFO 6.04 and SPSS 10.0 versions were used.

Ethical Considerations

Approval was secured first from The Ethical Clearance Committee of the Department of Community Health, Medical Faculty, Addis Ababa University. Then a written letter from the Graduate Coordinator of the Department was obtained and submitted to Sidama Zone Health Desk and SNNPR Health Bureau at Awassa. Similar letter written by the Zone was given to Aletawondo Woreda Health Office & Woreda Council and thereby to the health institutions, elementary schools and kebeles. Informed consent was obtained from each respondent (mother/care-taker) and they were also told to have the right to give-up the interview any time she/he wishes. Each case identified during the census and data collection was referred to Chucko Health Center and treated with antimalarials as recommended by the national guidelines. Health education was given for each respondent about malaria prevention and treatment, importance of owning a net and its consistent use, treatment and retreatment of nets.

Chapter 4 Results

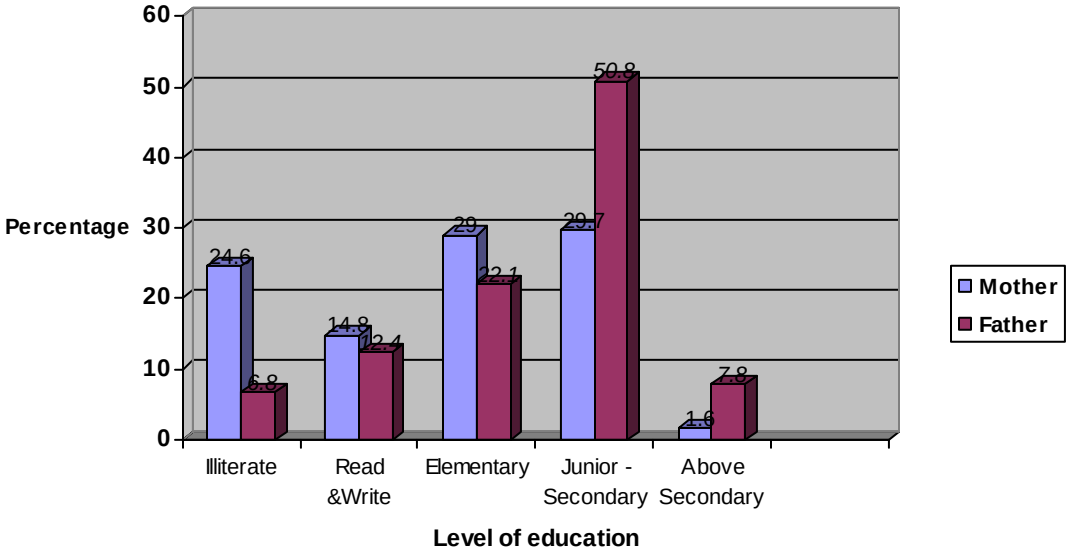
4.1 Socio-Demographic Characteristics of Respondents and Children

The study subjects constituted children 6-59 months of age. Of the total sample size (342), 317 (92.7%) responded for the questionnaire. A total of twenty-five questionnaires (nine from rural ITN users i.e. exposed, sixteen from urban area i.e. seven users & nine non-users of ITN) were excluded from the analysis because of incomplete information. Therefore, 81.5% of rural respondents and 94.6% of urban respondents gave complete information. Almost all (98.4%) of the respondents were mothers of children. Only three fathers and two other caregivers were interviewed since it was impossible to get the primary caregiver (the mother). The mean age of the respondents was 26.84 years (standard deviation, SD $\pm$ 4.95, minimum=18 & maximum =50 years). The majority (85.5%) of them were Christian by religion (*Table 1*). Most (84.5%) mothers are housewives and majority of fathers are either merchants (34.0%) or farmers (29.0%). Based on the responses provided by mothers/caregivers of children, the average monthly income of most (68.5%) families was less than 100 Birr. The average family size was 6.57 persons per household. The wall of majority (63.4%) of the houses is plastered with mud. Nearly half (43.5%) of the households do not have bedrooms. Hundred (31.5%) of the houses don't have kitchen and 89 (89%) of these cook inside the dwelling rooms. Hundred and ninety-five (61.5%) of the households had functional radio. Around 90% of the families used pipe-water for drinking followed by protected spring/well(7.2%) and only ten (3.2%) of the households (all of them from rural areas) used river water for drinking (*Table 1*) . About 58.7% of mothers attained at least primary education. On the other hand, 81.8% of the fathers attended at least primary level of education (*Figure2*).

Table 1: Socio-demographic characteristics of respondents, Chucko Town &surroundings rural kebeles, SNNPR, Feb 2005

Characteristics	N (%)
Age of respondent (years) (n=317)	
- 18-24	95(30.0)
- 25-34	181(57.1)
- 35-44	37(11.7)
- ≥45	4(1.3)
Religion of the mother (n=317)	
- Christian	271(85.5)
- Traditional religion	29(9.1)
- Muslim	17(5.4)
Occupation of the mother (n=316)	
- Housewife	267(84.5)
- Daily laborer	24(7.6)
- Merchant	12(3.8)
- Government employee	8(2.5)
- Other	5(1.6)
Occupation of the father (n=303)	
- Merchant	103(34.0)
- Farmer	88(29.0)
- Daily laborer	57(18.6)
- Government employee	37(12.2)
- Other	18(5.9)
Estimated monthly income of the household (Birr) (n=317)	
- <100	217(68.5)
- 100-299	63(19.9)
- 300-499	18(5.7)
- 500-800	16(5.0)
- >800	3(0.9)
Family size	
- <6	135(42.6)
- 6-10	165(52.7)
- 11-15	15(4.7)
Type of Wall (n=317)	
- Mud	201(63.4)
- Wood only	72(22.7)
- Cement	44(13.9)
Bedroom (n=317)	
- Yes	179(56.5)
- No	138(43.5)
Kitchen (n=317)	
- Yes	217(68.5)
- No	100(31.5)
Own functional radio (n=317)	
- Yes	195(61.5)
- No	122(38.5)
Source of drinking water (n=317)	
- Pipe water	284(89.6)
- Protected spring / well	23(7.2)
- River	10(3.2)

Fig. 2 Educational Status of Parents of Under-five Children, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR FEb 2005



Majority (87.7%) of the study subjects (children) were from Chucko Town (*Table 2*). The male to female ratio of children was 1:0.98. The median age of children was 27 months (SD ± 14.43, minimum=6 and maximum=59months) and the most frequent age was 48 months. Approximately half (51.2%) of study subjects were in the age range 12-35 months. Most (54.9%) of the households have two under-five children and on average, the number of under-five children per household was 1.61 (SD ± 0.55) (*Table 2*).

Table 2: Socio-demographic characteristics of under-five children, Chucko Town &surroundings rural kebeles, SNNPR, Feb 2005

Characteristic	Number (%)
Place of residence	
Urban	**278(87.7)**
Rural	**39 (12.3)**
Sex of the child	
Male	**160(50.5)**
Female	**157(49.5)**
Age of the child (months)	
<12	**33(10.4)**
12-23	**81(25.6)**
24-35	**81(25.6)**
36-47	**47(14.8)**
48-59	**75(23.7)**
Number of under five children in the family	
1	**136(42.9)**
2	**174(54.9)**
3	**7(2.2)**

4.2 Sleeping Pattern of Children

More than half (54.6%) of the children did not have regular sleeping place (*Table 3*). Nearly all of the children never passed the night outside home (97.2%) and an equivalent proportion (96.8%) of the children also didn't stay out of home during evening hours in the four months prior to the survey. Of those who reported history of sleeping outside, 4(44.4%) did so during hot nights and five (55.6%) did so at any night. Majority (80.1%) of the children studied slept with their mothers & fathers. Livestock were also found kept at night in living rooms in 31(9.8%) of the households, mostly in rural areas (*Table 3*).

Table 3: Sleeping pattern of children, Chucko Town & surrounding rural kebeles, Aletawondo Woreda, SNNPR Feb 2005

Pattern	Frequency, N (%)	Remark
Presence of regular sleeping place		
- **Yes**	**144(45.4)**	
- **No**	**173(54.6)**	
History of sleeping outside home		
- **Yes**	**9(2.8)**	
- **No**	**308(97.2)**	
Habit of staying out in the evening		
- **Yes**	**10(3.2)**	
- **No**	**307(96.8)**	
Person sleeping together with the child		
- **Mother with/without father**	**254(80.1)**	
- **Siblings**	**13(4.1)**	
- **Other person**	**49(15.5)**	
- **Alone**	**1(0.3)**	
Livestock kept in living room		
- **Yes**	**31(9.8)**	
- **No**	**286(90.2)**	

4.3 Malaria Related Knowledge &Practices

When mothers/caretakers of children were asked about knowledge of cause of malaria, nearly two-third (62.5%) of respondents attributed it to mosquito bite (*Table 4*). Some of the other factors incriminated were exposure to cold (16.1%), rain (19.6%), and others such as hunger, collection of dirty water around house & fog (6.3%). Some (10.7%) of the respondents cited multiple factors as cause of malaria. Forty-five (14.2%) of the interviewees knew nothing about its cause. Around four-fifth (78.9%) of the respondents believed that malaria could be transmitted from one person to another and 62 (19.6%) of the respondents said that malaria is not transmitted from person to person (*Table 4*). Of the former, 234 (93.6%) of these respondents said mosquito bite as way of this person-to-person transmission (*Table 4*).

Mothers/caretakers were asked about clinical features of malaria in children. Three hundred & two (95.3%) of them knew at least one symptom of malaria and fever was the most frequently reported sign/symptom (290/91.5%)(*Table 4)*. The other commonly known features reported were chills (86.4%), headache (86.1%), generalized aching (33.8%) and convulsion (16.1%). Coma, inability to take food & drink, vomiting, excessive sweating and 'whitening of face' were also mentioned as clinical features of malaria by 57(18%) respondents. Two-hundred & ninety (91.5%) knew more than one sign/symptom of malaria. About 5% didn't know any sign/symptom of malaria. Coma (59.6%) and repeated vomiting (57.1%) were described as the familiar severity signs of malaria in children (*Table 4)*. Other severity signs described by 22.7% of respondents were white face, severe headache, high-grade fever and profuse sweating. Only 14(4.4%) of the respondents were unable to mention at least one severity sign. Almost all (97.5%) the mothers/caregivers believed that malaria can kill children. When asked who is at higher risk of malaria, 87.4%, 55.8% & 23.6% of respondents recognized under-five children, pregnant women and old people as risk groups, respectively(*Table 4)*.

Their knowledge of treatment of malaria was also inquired and 218 (68.8%) of the respondents mentioned both chloroquine and *Fansidar*® as the drugs against the disease (Table 4). Other treatment methods reported by 12 (3.8%) respondents were Paracitamol, quinine, antibiotics, herbs, traditional healer and praying to God. Despite their ability to describe the number per dose, the shape & color of tables, 18 (5.7%) of the respondents were not able to mention the specific name of the drug. Fifty-one (16.1%) of the respondents didn't know any method of treatment of malaria (*Table 4).*

When asked about what they usually do when their children are sick with malaria, almost three-fourth (74.4%) said they take them to modern health institutions *(Table 4)*. About one-fourth (23.4%) of them said they buy either chloroquine or *Fansidar*® or both from local drug vendors and give them at home without consulting a health worker *(Table 4*).

Table 4: Malaria related knowledge & practices of mothers/caretakers of under-five children, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb 2005

Characteristics	Number (%)	Remark
Presumed causes of malaria (n=317)		
- **Mosquito bite**	**198(62.5)**	
- **Exposure to Cold or rain**	**113(35.7)**	
- **Other causes**	**21(6.3)**	
- **Multiple responses**	**34(10.7)**	
- **Don't know**	**45(14.2)**	
Person to person transmission of malaria(n=317)		
- **Yes**	**250(78.9)**	
- **No**	**62(19.6)**	
- **Not sure**	**5(1.5)**	
Way of person-to-person transmission(n=250)		
- **Mosquito bite**	**234(93.6)**	
- **Airborne(breathing)**	**20(8.0)**	
- **Touching**	**13(5.2)**	
- **Other**	**6(2.4)**	
- **Multiple ways(>1 above)**	**18(7.2)**	
Major signs/symptoms mentioned for malaria(n=317)		
▪ **Fever**	**290(91.5)**	
▪ **Chills**	**274(86.4)**	
▪ **Headache**	**273(86.1)**	
▪ **Generalized aching**	**107(33.8)**	
▪ **Convulsion**	**51(16.1)**	
▪ **Others**	**57(18)**	
▪ **Multiple response**	**290(91.5)**	
▪ **Don't know any sign/symptom**	**15(4.7)**	
Knowledge of severe signs/symptoms of malaria (n=317)		
Coma	**189(59.6)**	
Repeated vomiting	**181(57.1)**	
Inability to take food /drink	**108(34.1)**	
Convulsion	**70(22.1)**	
Others	**72(22.7)**	
Multiple responses	**209(65.9)**	

Don't know	**14(4.4)**
Can malaria kill children? (n=317)	
- **Yes**	**309(97.5)**
- **No**	**3(0.9)**
- **Not sure**	**5(1.6)**
Knowledge of risk groups (n=317)	
- **Under-five children**	**277(87.4)**
- **Pregnant women**	**177(55.8)**
- **Old people**	**75(23.6)**
- **Multiple response(under-five &pregnant)**	**110(34.7)**
- **Don't know any risk group**	**12(3.8)**
Malaria Treatment Methods mentioned (n=317)	
- **Both Chloroquine & Fansidar**	**218(68.8)**
- **Either Chloroquine or Fansidar**	**29(9.1)**
- **Other**	**12(3.8)***
- **Didn't know name of drug**	**18(5.7)**
- **Didn't know any**	**51(16.1)**
Usual practices for a child with malaria(n=317)	
- **Take them to government /private clinics**	**236(74.4)**
- **Buy chloroquine or fansidar or both**	**74(23.4)**
- **Other**	**6(1.9)**

Respondents' status on the knowledge & practices of prevention of malaria were also assessed. Two hundred & ninety-three (92.4%) said that malaria is a preventable health problem and 289 (98.6%) of these knew the methods of prevention (*Table 5*). Environmental management (85.1%) & ITN use (83.7%) were the two commonly cited means of prevention by the later. From those who knew at least one prevention method (289), 152 (52.6%) listed the two methods as combined tools to effectively prevent malaria transmission. But, during the time of the survey, only 155 (48.9%) and 83(26.1%) of the total respondents were using ITN and environmental management, respectively. Furthermore, only 36 (11.4%) of the respondents were simultaneously using ITN & environmental management for prevention of malaria. Surprisingly enough, 99 (31.2%) of families were doing nothing to prevent their children from malaria (*Table 5*). DDT spraying was not conducted in the study area in the past 12 months.

Table 5: Malaria prevention knowledge & practices of mothers/caretakers of under-five children, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb 2005

Malaria Prevention issue	N (%)	Remark
Is malaria preventable?		
- **Yes**	**293(92.4)**	
- **No**	**19(6)**	
- **Not sure**	**5(1.6)**	
Knowledge of methods of prevention (n=293)		
- **Yes**	**289(98.6)**	
- **No**	**4(1.4)**	
Methods listed as prevention tools (n=289)		
- **Environmental management**	**246(85.1)**	
- **ITN use**	**242(83.7)**	
- **DDT spraying**	**41(14.2)**	
- **Insecticidal spraying other than DDT**	**26(9.0)**	
- **Smoking materials, using herbs(e.g. olive & eucalyptus tree)**	**23(8.0)**	
- **Multiple as a whole**	**222(76.8)**	
- **Multiple methods (Net use &Environmental management)**	**152(52.6)**	

Current practices of malaria prevention (n=317)	
- **ITN use**	**155(48.9)**
- **Environmental management only**	**83(26.1)**
- **ITN use+ Environmental management**	**36(11.4)**
- **Spraying insect killers& smoking materials**	**26(8.2)**
- **Herbs as repellents**	**15(4.7)**
- **Nothing**	**99(31.2)**

4.4 Use of Insecticide Treated Bednets & Retreatment Issues

Initially, regular 171 ITN users and 171 non-users were randomly identified. But, 16 from ITN users and 9 children from non-users were excluded from the analysis because of incomplete/inconsistent information on some questions despite many efforts to re-fill the questionnaires by returning to the respective homes. So, 155 (49.8%) regular ITN users and 162 (50.2%) non-users were included in the analysis (*Table 6*). Seventy-seven (49.68% of the 155) of the households owned one ITN, 70 (45.16%) of the households had two ITNs and only eight (5.16%) households owned three ITNs. Nearly half (43.87%) of the ITNs were obtained in the 12-23 months prior to the study period. Almost 70% of the ITNs were owned within the past two year's period. Only two ITNs were obtained three or more years before the study period. The mean age of the ITNs was 17.3 months (SD$\pm$7.45, minimum 6 months, maximum 42 months). The sources of ITNs were Chucko Health Center, 88(56.8%), Missionary Elementary Schools (Kalehiwot, Muluwongel and Mekan Yesus), 40(25.8%) and shops, 25(16.1%). Two (1.3%) ITNs were purchased from street vendors. Families paid money for 115(74. 2%) of the ITNs and the remaining 40(25.8%) were freely obtained from the missionary schools (*Table 6*).

The highest price paid was 50 Birr /ITN (shop) and the lowest cost was 18 Birr /ITN (health center).

All the selected bednets were pretreated with the insecticide permethrin. Most (84.5%) of the treatments of ITNs were done by health workers followed by shop-keepers (9.7%). The treatments of nine (5.8%) ITNs were conducted by family members (Table 6).

Mothers/caretakers were asked about retreatment issues of ITNs. Hundred and one (65.2%) of them knew that their ITNs should have been retreated and the remaining 54(34.8%) didn't know their ITNs should be retreated (Table 6). Only 57(56.4%) of those knew that the ITNs they own should be retreated every 6 months as recommended by the manufacturer of the ITNs (Table 6). However, only 5(3.2%) of all the ITNs were retreated at least once and this was so within the past 6 months. Almost two-thirds (65.2%) of the ITNs were treated only once while they were obtained a year prior to the survey. The major reasons given for not retreating ITNs as prescribed were unavailability of the retreatment service (71.3%) and lack of knowledge when to retreat the ITN (22.7%) (Table 6).

Table 6: ITN Ownership and retreatment characteristics, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

Issue	Number (%)	Remark
Ownership of ITN (n=317)		
- **Yes**	**155(49.8)**	
- **No**	**162(51.2)**	
Number of ITNs owned (n=155)		
- **1**	**77(49.7)**	

- 2	70(45.2)
- 3	8(5.1)
Dates when ITNs obtained (n=155)	
- 6-11	41(26.4)
- 12-23	68(43.9)
- 24-35	44(28.4)
- 36-47	2(1.3)
Places where ITNs were obtained (n=155)	
- Chucko Health Center	88(56.8)
- Local Missionary Schools	40(25.8)
- Shops	25(16.1)
- Street vendors	2(1.3)
Payment status for the ITN(n=155)	
- Money paid for it	115(74.2)
- Freely obtained	40(25.8)
Person treated the ITNs (n=155)	
- Trained family member	3(1.9)
- Untrained family member	6(3.9)
- Health workers	131(84.5)
- Shop-keepers	15(9.7)
Respondents' knowledge on frequency of retreatment(n=155)	
- Every 1-5months	23(14.8)
- Every 6 month	57(36.8)
- 12 months	20(12.9)
- 24 month	1(0.7)
- Don't know whether to be retreated or not	54(34.8)
History of retreatment of nets (n=155)	
- Yes	5(3.2)
- No	150(96.8)
Last treatment dates of nets (n=155)	
- <6months	5(3.2)
- 6-12 months	49(31.6)
- >12 months	101(65.2)
Reason for not retreating nets as prescribed (n=150)	
- Retreatment service not available	107(71.3)
- Don't know when to retreat	34(22.7)
- Don't know benefits of retreating nets	5(3.3)
- No money to make it retreated	4(2.7)

4.5 Technical Issues Related to Insecticide Treated ITNs (ITNs) Use

Most of the ITNs used by children were medium-to-large in size (95.5%) and rectangular in shape (83.2%) (*Table 7*). The other technical factors that can influence

effectiveness of ITNs were also assessed at household level. About 127(82%) of the ITNs had been frequently washed (at least twice in 6 months) (*Table 7*). Although most (67.7%) knew about drawbacks of frequent washing, the major reason (97.6%) given for doing that was because the ITNs got dirty with dust & smoke. Seventy (45.2%) of the respondents said that child's ITN has holes (tears) and this was confirmed by observation of interviewers. It was found that 48(68.6%), 13(18.6%), and 9(12.8%) of these ITNs have 1-4, 5-7, and 8-15 holes respectively. As a whole, nine ITNs (5.8%) were said to be in bad condition (more than seven holes). Sixty-six (42.6%) of mothers/caretakers said that their children sometimes rolled out of the ITN during night time (*Table 7*).

Table 7: Technical Factors related to ITN use by children, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

Technical Issues	Frequency (%)	Remark
ITN size		
- **Small**	**7(4.5)**	
- **Medium-to-large**	**148(95.5)**	
Shape of ITNs owned		

- **Rectangular**	**129(83.2)**
- **Conical**	**26(16.8)**
Washing frequency of ITNs in 6 months period(n=155)	
- **Never washed**	**25(16.1)**
- **Once**	**3(1.9)**
- **Twice or more**	**127(82.0)**
Knowledge of drawbacks of frequent washing	
- **Yes**	**105(67.7)**
- **No**	**50(32.3)**
Reasons for frequent washing (at least twice)(n=127)	
- **ITN gets dirt frequently with dust/smoke**	**124(97.6)**
- **ITN gets dirt with excreta of child**	**2(1.6)**
- **Fear of poisoning for children**	**1(.8)**
Presence of hole in the ITNs (n=155)	
- **Yes**	**70(45.2)**
- **No**	**85(54.8)**
Child sometimes roll out of the ITN (n=155)	
- **Yes**	**66(42.6)**
- **No**	**89(57.4)**

4.6 Reasons for Use/not Use ,Perceptions for ITNs & their Prices

Mothers/caretakers were asked about why they made their children to use ITNs. Getting comfortable sleep by avoiding nuisance of mosquitoes, prevention of malaria and both benefits were the major reasons given by 128(82.6%), 113(72.9%),and 100(64.5%) respondents, respectively(Table 8). They were also asked about their perception towards the effectiveness of insecticide treated ITNs in contrast to the untreated one. About 111(71.6%) believed that treated net was more effective than untreated one. Thirty-two (20.7%) said that treated ITN was initially effective. But when time goes, they are not seeing what was happening initially and now there is no difference. The rest 12(7.7%) didn't appreciate the difference. When asked why they said treated ITN was more

effective than untreated one, 68(43.8%) justified that they were getting so many dead mosquitoes and 67(43.2%) said there were no buzzing sounds and 34(21.9%) reported absence of mosquito bites as their justification. Only 19(12.3%) gave reduced malaria illness as their witness for the effectiveness of treated ITN. Sixty-nine (44.5%) of the respondents gave more than one reason (Table 8).

The major reason given for not owning at least one ITN is high cost despite knowing the benefits (64.2%) followed by lack of awareness about prevention of malaria using ITNs (17.9%)(*Table 8*). Almost three-fourth (73.8%) of the respondents said that the current cost of ITNs is very expensive. Many said that the ITN should be sold by 10 Birr (23.3%) followed by 5 birr (19.2%). The median price suggested was 7.00 birr (SD± 6.36 Birr). It was suggested ITNs should be distributed freely by majority of respondents (86.1%). Almost all (96.8%) of the respondents said treatment/retreatment of ITNs should be done free of charge (*Table8*).

Table 8: Reasons for use/not use, perceptions related to effectiveness and prices of ITNs Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

Variables	Number (%)	Remark
Reason for making their children to use ITNs(n=155)		
- Getting comfortable sleep by avoiding nuisance	5(3.2)	
- Prevent malaria	60(38.7)	
- Both comfort , warmth& malaria prevention	90(58.1)	
Perceived impact of ITN vs untreated ITN(n=155)		
- More effective	111(71.6)	
- Initially effective but later decreased	32(20.7)	
- Didn't appreciate difference	12(7.7)	
Why ITN was more effective?(n=143)		
- Saw many dead mosquitoes	68(43.8)	
- No buzzing of mosquitoes	67(43.2)	
- No mosquito bite	34(21.9)	
- Reduced malaria in ITN using children	19(12.3)	
- More than one justifications	69(44.5)	
Reason given for not owning ITN(n=162)		
- Don't know prevention of malaria using ITN	29(17.9)	
- High cost of ITN	104(64.2)	
- No supply of ITNs	19(11.7)	
- Not a priority(Didn't think about it)	10(6.2)	
Perception about current price of ITN(n=317)		
- Very expensive	234(73.8)	
- Fair	64(20.2)	
- Very cheap	19(6.0)	
Suggested price of ITN		
- Free	13(4.1)	
- 1-5 Birr	120(37.9)	
- 6-10 Birr	137(44.2)	
- 11-15 Birr	14(4.4)	
- 16-20 Birr	26(8.2)	
- 25-50	7(2.2)	
Should ITNs be distributed for free?		
- Yes	273(86.1)	
- No	44(13.9)	
Should ITNs be retreated freely?		
- Yes	307(96.8)	
- No	10(3.2)	

4.7 History of Malaria &Other Diseases in Children and their characteristics

Using different sources of information including recall of mothers/caretakers, 151(47.6%) of children developed clinical malaria during the assessment period (September through December) (*Table 9*). For 23(15.2%), the IMCI clinical record was supported by positive laboratory result and of those confirmed cases, only 2(8.6%) were *P. vivax* & the rest 21(91.4%) were *P .falciparum*. Majority, 95(62.9%) were classified as probable and the rest 33(21.9%) as possible malaria cases. Eighty (25.2%) of the children were reported to have experienced other illnesses in the past four months. Forty-eight (15.1%) of these children experienced both malaria and other illnesses during the study period (Table 9). Of the 80 cases of other illnesses, 19 (23.8%) and 14 (17.5%) were diarrhea & pneumonia, respectively.

For 123(81.5%) malaria cases, antimalarial drugs were given at modern health facilities including private clinics (*Table 9*). About 19(12.6%) malaria cases were treated at home using antimalarial drugs bought by parents from drug vendors. The remaining nine (5.9%) of children were given traditional treatments at home (*Table 9*).

Table 9: History of malaria, other illnesses & the treatment given for under-five children from Sep-Dec 2004, Chucko Town & Nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

Disease	Number (%)	Remark
History of Malaria(n=317)		
- **Yes**	**151(47.6)**	
- **No**	**166(52.4)**	
Classification of malaria(n=151)		
- **Confirmed case**	**23*(15.2)**	***21 were *P. falciparum* & 2 were *P. vivax***
- **Probable case**	**95(62.9)**	
- **Possible case**	**33(21.9)**	
Other illnesses(e.g. pneumonia, diarrheal diseases)(n=317)	**80(25.2)**	
- **Yes**	**237(74.8)**	
- **No**		
Experienced both malaria & other illness(n=317)		
- **Yes**	**48(15.1)**	
- **No**	**269(84.9)**	
Treatment given for malaria cases(n=151)		
- **Anti-malarial prescribed at health institution**	**123(81.5)**	
- **Anti-malarial prescribed by parents**	**19(12.6)**	
- **Traditional treatments**	**9(5.9)**	

Majority (53%) of the cases of malaria are in the age range of 12-35 months (Table 10). Male cases were slightly higher than female cases (51.7% vs 48.3%). Almost four-fifth (85.4%) of the malaria cases were children from the urban area. Most of the cases were from families owning two under-five children (59.6%) and total family size of 6-10 (57.0%). About two-third of children with malaria were from families with monthly income of <100 Birr (66.2%), house with mud wall (64.9%) and kitchen (63.6%). More than half (57.6%) of the cases were also from families with a functional radio. Hundred and thirty (86.1%) of malaria cases were using pipe water. Only six (4.0%) cases reported to use river water for drinking (*Table 10*).

Greater proportion (56.3%) of children with history of malaria didn't have regular sleeping places (*Table 10*). Most (95.4%) of these cases didn't have habit of staying out during evening times. Only 16.6% of families of cases of malaria reported livestock kept at night in the living room, mostly in rural areas (*Table 10*).

Table 10: Socio-demographic & sleeping characteristics of *cases of malaria* from September-December 2004, Chucko Town & Nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

Characteristics	N (%)	Remark
Age range		
- **6-11**	**16(10.6)**	
- **12-23**	**40(26.5)**	
- **24-35**	**40(26.5)**	
- **36-47**	**26(17.2)**	
- **48-57**	**29(19.2)**	
Sex		
- **Male**	**78(51.7)**	
- **Female**	**73(48.3)**	
Place of residence		
- **Urban**	**129(85.4)**	
- **Rural**	**22(14.6)**	
Number of under-five children in the family	**58(38.4)**	
- **One**	**90(59.6)**	
- **Two**	**3(2.0)**	
- **Three**		
Family size		
- **1-5**	**61(40.4)**	
- **6-10**	**86(57.0)**	
- **11-15**	**4(2.6)**	
Monthly income of family(Birr)		
- **<100 Birr**	**100(66.2)**	
- **100-299**	**36(23.8)**	
- **300-499**	**9(6.0)**	
- **500-800**	**6(4.0)**	
Type of wall		
- **Mud**	**98 (64.9)**	
- **Cement**	**13(8.6)**	
- **Wood**	**40(26.5)**	
Kitchen		
- **Yes**	**96(63.6)**	
- **No, cooks inside**	**47(31.1)**	

- **No, cooks outside**	**8(5.3)**
Ownership of functional radio	
- **Yes**	**87(57.6)**
- **No**	**64(42.4)**
Water source	
- **Pipe water**	**130(86.1)**
- **Protected spring/well**	**15 (9.9)**
- **River**	**6(4.0)**
Regular sleeping place for the child	
- **Yes**	**66(43.7)**
- **No**	**85(56.3)**
Habit of staying out during evening	
- **Yes**	**7(4.6)**
- **No**	**144(95.4)**
Livestock kept inside living room during night	**25(16.6)**
- **Yes**	**126(83.4)**
- **No**	

4.8 Comparison of Malaria and Other Outcomes among ITN User and Non-User Children

History of at least one malaria attack from September to December 2004 was compared between ITN users and non-users. It was found that non-users were 0.565 (95%CI 0.346-0.925) p =0.023) times more likely to have malarial attacks than users. ITN was found to have a 43.5% individual protective effect from malaria after adjusting for so many possible confounding factors (place of residence, family size, income, literacy status of mother, type of wall, presence of other prevention practices, malaria related knowledge /perceptions, etc.). No association was found between other illnesses and ITN use (Adjusted OR=.516(.115-2.312)) (Table 11)

Table 11: History of Malaria versus ITN use by under-five children of Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb. 2005

ITN Use	Malaria			Odds ratio (95%CI)	p value
	Yes	No	Total		
Yes	60	95	155(48.9)	Crude= 0.493 (0.315-0.771)	0.00132
No	91	71	162(51.1)	Adjusted OR=.565 (.346-.925)	0.023
Total	151(47.63)	166(52.37)	317(100)		
Other illnesses (e.g. Pneumonia, diarrhea, etc)					
ITN use	Other Illness			Odds ratio (95%CI)	p value
	Yes	No	total		
Yes	39	116	155	Crude= 0.992 (0.598-1.647)	.387
No	41	121	162	Adjusted OR = .516(.115-2.312)	
Total	80	237	317		

4.9 *Factors Influencing Effectiveness of ITNs for Malaria Prevention*

Finally, it was tried to assess why some reported regular ITN users had malaria attack and others not. A set of household factors were entered in a forward stepwise (*Wald*) regression model (*Table12*). As can be seen in the table below, those children who were from large families (>5) were 1.49 times more likely to have had malaria than those children from family size $\leq$5 and this was statistically significant (95% CI 1.23-26.7; p=0.035) .There was also a statistically significant relationship between literacy status of mother of the child and reported history of malaria during the study period. Children of illiterate mothers were found to be 0.343 times less likely to be affected than their literate counterparts (95% 0.119-0.99; p=0.03). Presence of more than one under-five children and history of malaria among ITN users was also assessed and there was no

association found (p>0.05). Housing characteristics that can influence effectiveness of ITNs were also assessed. Type of wall of houses, presence of bedroom, kitchen and functional radio were compared between cases and non-cases and no statistically significant associations found (p>0.05)(*Table 12*).

There was no statistically significant relationship between selected sleeping patterns of children such as presence of regular sleeping place , history of staying out during evening times , and history of malaria during the study time(p>0.05). It was found that children whose families kept livestock inside the living room were 8.43 times more likely to have had history of malaria during the study period and this was statistically significant (95%CI =1.3-55.6; p=0.027)

Whether malaria -related knowledge of mothers/caretakers of children would influence protective effect of regularly used ITNs was evaluated. Children whose mothers/caretakers attributed mosquito bite as way of person-to-person transmission of malaria were 0.375 times less likely to had been diseased with malaria during the peak transmission period studied (95%CI=0.147-0.955; p=0.04).

ITN -related issues such as time of obtaining nets, source , history of retreatment , last treatment/retreatment dates, etc were also compared between those with the outcome & without the outcome(malaria). It was found that children who were using ITNs obtained at least 12 months prior to the survey were 3.62 times more likely to have had experienced malaria illness than those who were using ITNs with <12 months of age(95%CI= 1.29-10.20, p=0.015). Using ITNs purchased from local shops or using those ITNs which had never been retreated were not found to demonstrate statistically significant relationships (P>0.05). But children who were using ITNs treated/retreated

more than 12 months ago were 4.8(OR=1.75-12.92) times more likely to have had malaria during the study period and this was statistically significant (p=0.002) (Table 12).

It was also found that the history of malaria in children who were using ITNs with holes/tears was 3.26 times higher than those who were using ITNs without holes/tears(95% CI= 1.44-7.4 p=0.005). Frequent washing of ITNs (at least two times in six months) was also a factor influencing protective effect of ITNs .Those children who were using frequently washed ITNs were 3.275 times more likely to report history of malaria despite regular use of ITN(95%CI= 1.014-10.57 p=0.003). Rolling of the child out of the ITN during night time was also found to change effect of ITNs as there was a 3.337 (95%CI=1.58-7.184; p=0.011) times greater history of malaria in those children reported to have had that event(Table 12). Other possible factors studied were size of ITN and shape of ITNs. However, there were no statistically significant associations (p>0.05) for the above stated factors (Table 12).

Table 12: Factors influencing effectiveness of ITNs among malaria cases and non-cases within the ITN user under-five children, Chucko Town & nearby rural kebeles, Aletawondo Woreda, SNNPR Feb 2005

Factors in net owners*	Malaria		Crude Odds ratio (95%CI)	Adjusted OR 95%CI) (Forward stepwise logistic model)**
	Yes	No		
Family size greater than five(>5)	40	59	1.22(0.59-2.54)	1.49(1.23-26.7)
Family size less than or equal to five(≤ 5)	20	36	1.00	
Number of under-five children in the household >1	35	54	1.06(0.52-2.16)	
Number of under-five children in the household =1	25	41	1.00	
Mother was illiterate	7	22	.44(0.16-1.81)	0.343 (0.119-0.990)
Mother was literate	53	73	1.00	
Mud / wood wall of house	52	72	2.08(0.8-5.51)	
Cemented wall of the house	8	23	1.00	
No bedroom in the house	28	36	1.43(0.71-2.91)	
Has bedroom in the house	32	59	1.00	
No kitchen in the house	48	75	1.07(0.45-2.57)	
Owned kitchen	12	20	1.00	
No functional radio for the family	14	24	.9(0.39-2.04)	
Own functional radio	46	71	1.00	

No regular sleeping place for the child **Has regular sleeping place**	**27** **33**	**45** **50**	**.91(0.45-1.83)** **1.00**	
Child stays outside home during evening **No habit of staying out**	**3** **57**	**2** **93**	**2.45(0.32-21.7)** **1.00**	
Live stock kept in the living room at night **Live stock not kept in living room at night**	**6** **54**	**2** **93**	**5.17(0.87-53.51)** **1.00**	**8.43(1.3-55.6)**
Attributed mosquito bite for person-to-person transmission of malaria **Didn't Attribute mosquito bite**	**42** **18**	**78** **17**	**.51(0.22-1.16)** **1.00**	**0.375(0.147-0.955)**
ITN obtained at least 24 months prior to survey **ITN obtained less than 24 months prior to survey**	**21** **39**	**25** **70**	**3.47(1.2-10.25)** **1.00**	**3.62(1.29-10.20)**
ITN was obtained from local shops **ITN was obtained from Health Center or Schools**	**11** **49**	**14** **81**	**1.3(0.5-3.34)** **1.00**	
ITN was never retreated once obtained **ITN was retreated at least once**	**59** **1**	**91** **4**	**2.59(0.25-129.85)** **1.00**	
Last (re)treatment of ITN was >12 months **Last (re)treatment of ITN was ≤12 months**	**47** **13**	**54** **41**	**2.75(1.24-6.14)** **1.00**	**4.8(1.75-12.92)**
Presence of holes/tears in the ITN **No holes/tears in the ITN**	**36** **24**	**34** **61**	**2.69(1.31-5.54)** **1.00**	**3.26(1.44-7.4)**
Frequent washing (≥ 2 times over 6months) **ITN washed once or not at all over 6months**	**56** **4**	**71** **24**	**4.73(1.49-19.68)** **1.00**	**3.275(1.014-10.57)**
Child Rolled out of the ITN during night time **No reported history of rolling of child out of ITN**	**35** **25**	**31** **64**	**2.89(1.41-5.97)** **1.00**	**3.337(1.58-7.184)**
Small size of the ITN **Medium-to-large size of ITN**	**5** **55**	**2** **93**	**4.23(0.66-45.38)** **1.00**	
Conical shape of ITN **Rectangular shape of the ITN**	**11** **49**	**15** **80**	**1.20(0.47-3.04)** **1.00**	

*** Variables entered in the forward stepwise regression model**

****Statistically significant variables in the final step of the model**

Chapter 5 Discussion

To make baseline exposure similar, this study used reported regular insecticide treated ITN users since the Ethiopian New Year as group one (exposed cohort) and non-users/non-owners as comparison (control) group (non-exposed cohort). Irregular users were excluded from the sampling frame because a single night without ITN use could predispose the child to malaria. Untreated ITNs were also excluded from the sampling frame as the national malaria control programme focus is by using bednets treated with synthetic pyrethroid insecticides (permethrin) (7,27).

In this research, we tried to compare the history of malaria attack in the past four months (September- Dec 2004) from reliable sources. The key reasons why some regular ITN users were sick with malaria and others not were also assessed. For reasons which could be from poor mobilization of the community about the benefits of ITNs and inadequate access to ITNs, the coverage of ITNs in rural catchment kebeles of Chucko Health Center was extremely low. Because of that, all of those rural ITN users who fulfilled the inclusion criteria were included in the sample. On the other hand, as the ITN users were relatively higher in Chucko Town, a separate sampling frame was prepared for ITN users & non-owners and a random sample was drawn from each list using a random number list.

After adjusting for possible confounding factors, history of malaria during the peak transmission periods (September -December) among regular ITN users was 43.5% less than that of non-users of ITN. This was statistically significant (OR=.565 95%CI 0.346-.925). This individual protective effect is lower when compared to a result from different studies around world's most malarious areas. Though the exact figure was not described, ITNs are reported to have at least 50% protective effects from malaria in under-five children of Zambia (45, 55). A repeated cross-sectional assessment conducted on under-two children in the Kilombero Valley, Tanzania revealed an impact of the ITN in reducing the prevalence of anemia and parasitaemia by 60 % (47). From a report of Gambian National Impregnated ITN Programme where the coverage & retreatment of ITNs in country were more than 80 %, there were 59% fewer episodes of uncomplicated malaria in under-two children who used ITNs (54). Repeated studies for assessing public health impacts of ITNs in Afghanistan demonstrated a 59-69% reduction in the risk of

symptomatic *Plasmodium falciparum* infection among ITN users compared with non-users (56). In Kenyan Highlands, ITN use was reported to be 63% (58-68%) protective (39). The reason may be that in all the above areas, greater ITN coverage was achieved, and extensive public education and regular retreatment were given on continuous bases. Greater coverage with regular retreatment services and continuous education of the community were found to have highly protective effects not only to individuals, but also to the community at large (54-55). Unlike the above areas, in Chucko Town and surrounding rural kebeles, the efforts to educate the public on the importance of ITNs and their proper utilization has been very limited. As a result, the coverage was very low especially in rural areas. There was no retreatment service provided for ITN users. Only five ITNs were reported to be retreated and this was in the past six months. Therefore, it might not be a surprise for the protective effects of ITN in the study area to be low.

The reasons why some of the reported regular users of ITNs were infected with malaria during the high transmission periods and others not were as well assessed. Socio-demographic characteristics of families of children were compared between cases and non-cases among ITN users. Of those, large family size (>5) was found to significantly increase the likelihood of malaria in children almost by 50% (OR=1.49). Though no studies so far, the current finding may be due to the fact that large family size may increase the risk for malaria by favoring efficient person-to-person transmission, affecting nutritional status of children and other childcare practices. There could also be a tendency to live in a crowded condition and share ITNs of children. Especially when ITNs are small in size and conical in shape, sharing of ITNs can lead to exposure of children's bodies to mosquito bite (5). The effect of number of under-five children in the

family was also assessed but no significant relationship was found. There is no other study on this issue, too to compare findings with. In addition to the above effects, it was expected that a birth of young child can result in neglecting of the older sibling in all childcare aspects. These can predispose the child to malaria.

The direction of relationship between the level of education of the mother and reported history of malaria in the child was found to be contrary to what was expected. History of malaria in children of illiterate mothers/caretakers was lesser and it was highly significant ($p<0.001$). The possible explanation could be that the ITNs of these children might have been obtained later than the ITNs of children of literate mothers/caretakers. Literate people are said to be more informed about health-related issues and adopt new health services relatively earlier than illiterate people. Since there was no retreatment services provided, those ITNs obtained in the past one year might be still effective when compared to those obtained earlier.

Housing conditions of families were examined with the assumption that walls plastered with mud could attract mosquitoes and enable them to hide from sight. Wood walls on the other hand, can allow mosquitoes to easily enter into living rooms as they were full of holes. Adequately sealed walls, properly closed windows and doors can protect entrance of mosquitoes and thereby preventing suddenly rolled out children from mosquito bite during night time. But this study failed to show this effect and there was no report from others studies worldwide confirming whether type of wall can influence the effect of ITNs or not. No statistically significant association was found between presence/absence of bedroom & regular sleeping place for the child in the household and malaria. The notion was that absence of bedroom could lead to improper hanging of ITNs

and frequent change of sleeping place of the child which lead to infrequent use of ITNs. These infrequent use may expose the child to mosquito bite and thereby malaria. There was no similar study to support this reasoning to date. From Ugandan & Kenyan studies, it was found that displacing the sleeping place of children, for instance due to guests, was one of the reasons for infrequent use of ITNs (41, 43). The degree to which infrequent use of ITN use results in diminished protection against malaria is unknown (43). The influence of absence of kitchen and cooking inside living rooms were also evaluated and no statistically significant relationship was found .There was no study report on effect of this in & outside Ethiopia (5). Cooking inside home in most rural & semi-urban areas of Ethiopia is common and this will lead to emission of smoke. It is not known whether this smoke could affect the efficacy of the insecticide and reduce the half-life of the ITN. But, from a study report about risk factors for malaria in children of northern Ethiopia, absence of separate kitchen was found to significantly increase the incidence of malaria (59). The relationship between ownership of functional radio and history of malaria was insignificant. Owning radio may help mothers/caretakers to be informed about proper use of ITNs and hence their children be well protected from malaria.

The history of malaria in children from households where livestock kept at night inside living room was 8.43 times greater. From other studies about risk factors of malaria, livestock in the sleeping room was one of them (59). So, this finding is consistent with the reports of others. The reasons could be the droppings of livestock in the living room may attract both non-anopheles and anopheles. While the attracted non-anopheles feed on feces of livestock, female anopheles bite human as the repelling action of ITNs has decreased due to absence of retreatment.

Attributing mosquito bites as way of person-to-person transmission of malaria by mothers/caretakers was found to significantly reduce the probability of malaria in children ($p<0.05$). This may be due to the fact that mothers/caretakers believing this might have done any attempt to protect their children from mosquito bites.

Those children who were using ITNs obtained at least two years (24 months) prior to the survey were 3.62 times more likely to report malaria in the high transmission period considered. The explanation could be that older ITNs might have holes /tears and this can decrease the protective effects. Moreover, the absence of retreatment of ITNs might have greatly reduced ITN effectiveness, too. For possible reason of low power to detect statistical significance, it was not possible to observe a difference in history of malaria between children who used retreated and never retreated ITNs. From other studies, regularly retreating ITNs every 6 months was a strong factor increasing the protective effect of ITNs (5, 18). Assuming that ITNs obtained from local shops might have been improperly treated with permethrin and mothers/caretakers less informed about their proper use, this study tried to see whether there was a difference in impacts of ITNs obtained from different sources. But, there was no statistical significance and there are no other studies which evaluated the effect of source of ITNs. The last treatment/retreatment date of ITNs was found to have significant impact in prevention of malaria. Those children who were using ITNs treated/retreated more than 12 months ago were more than three times more likely to report history of malaria and this finding is consistent with other studies reviewed by Lengeler C & colleagues(5). The repelling and killing effect of permethrin from randomized controlled trials was found to be 6-12 months depending on the pattern of transmission (18, 22, 43, 46) and ITNs in the study area should have been

retreated every 6 months. Absence of retreatment services as recommended has undoubtedly reduced the effectiveness of ITNs.

Presence of holes (tears) in the children's ITNs were also found to significantly increase the probability of malaria in the children and this finding is in line with efficacy studies elsewhere as periodically reviewed by Christian Lengeler(18). Once the repelling effect of the insecticide wanes off, anopheles can enter through the holes /tears and bite children exposing to infection. Frequent washing was also found to reduce effectiveness by about three times. Review of randomized trials also revealed similar findings. From these studies, frequent washing reduced the concentration of permethrin on the netting materials and the killing and repelling abilities of the insecticide and thereby overall effectiveness of ITNs (5, 18). Children reported to have sometimes rolled out of the ITNs during night were more likely to have had malaria. These might have exposed children's bodies to mosquito bites and thereby infection. This finding is in line with reports from other studies (4, 22).

From other studies outside Ethiopia, small size of ITN was found to be a risk factor for malaria (5, 22). But here we didn't get such finding. The reason they gave was that, regardless of size, ITNs were usually shared by at least two people in most African families so that some parts of the body especially the extremities might have been exposed and bitten by infected mosquitoes (5, 22, 43).In this study, low power weak enough to detect the difference could explain this as the number of children using such size of ITNs were very small.

The summary of the factors influencing effectiveness of ITNs according to the regression model this particular study used were large family size, keeping livestock in

the living room, using ITNs aged more than two years, lack of retreatment of ITNs for more than 12 months, presence of holes/tears in the ITN they use, frequent washing of ITN and history of rolling of children out of the ITN during night time. Most of these findings were also reported from a study of field issues influencing effectiveness of ITNs by Lengeler C & colleagues (18).

Despite the presence of so many factors affecting the ITN programme in the area, this effectiveness estimate was approximately equal to those found in most controlled trials in Africa (4,25). Could this finding be the result of residual confounding despite efforts to control for it? The tools used to measure confounding factors such as socioeconomic status (e.g. place of residence, age, income, education status, housing characteristics, etc.) and malaria -related knowledge & behaviors may not be sensitive enough to allow for proper control of confounding factors. Low coverage in the area may not have community protective effects and this may exaggerate individual protective effects as comparison groups were those children with no ITNs. Despite trying to control confounding and interaction through stratification and logistic regression methods, taking a one high-malaria transmission period (September-December) for evaluating ITN programme at household level could have also inflated the effectiveness of ITNs as people can use more than one malaria protection methods such as environmental management, herbs and smoking & spraying of locally available materials . On the other hand, in areas where the major vector(s) bite(s) primarily indoors or late at night, the nets can be expected to be more effective than in areas where the vectors feed outdoors before people go to sleep or after they get up(57). The former pattern is expected in Chucko and this might truly explain the high individual protective effect observed in the study area.

Finally, similar to findings from other studies across Africa (24, 41), cost was almost solely the major factor for not owning ITNs in the study area. Virtually all the respondents suggested that ITNs and also the retreatment services should be provided with no any charge. In countries like Tanzania, social marketing programmes of ITNs were sustainable (14, 40). On the contrary, in Kilifi, Kenya, when charge was introduced following end of project of randomized trial, the use of ITNs and the retreatment rates were found to reduce abruptly (58).

Chapter 6 Strength and Limitations of this Study

Strengths of the study

- Used different sources of information both during determining exposure level and outcome measure
- Restricted inclusion criteria for both exposed and unexposed cohort
- Tried to include both rural and urban population.

Limitations of the study

The major limitations of this study are:

1. Recall bias because most of the presence of exposure and outcome ascertainment was done through respondents' information

2. Interviewers may introduce bias while collecting data by overstressing the sign and symptoms of malaria in non-users of ITN while underestimating these in ITN users
3. Misclassification bias is a threat for this study because the reported regular users might be irregular users. Misclassifying those with the outcome as non-cases and vice versa especially for those with no records for confirmation was found to be another threat for the results of this study.
4. Very short duration of study period (one peak transmission period only) and that might have exaggerated the effect of ITNs
5. Absence of local and inadequate effectiveness studies along the globe made comparison difficult

Chapter 7 Conclusion & Recommendations

Keeping in mind the above limitations, the following conclusions were made. Despite the presence of many programmatic deficiencies, ITNs were found to have significantly protected under-five children from malaria when used during peak transmission periods. The summary of the factors influencing effectiveness of ITNs in this particular study used were large family size, keeping livestock in the living room, using ITNs aged more than one year, lack of retreatment of ITNs for more than 12 months, presence of holes/tears in the ITN they use, frequent washing of ITN and history of rolling out of children from the ITN during night time. With these findings, the following recommendations are made:

1. The distributions of ITNs should be preceded by intensive health education on clear benefits of ITNs and issues related to them such as retreatment, washing frequency, etc.
2. When ITNs are considered as primary malaria prevention tools, retreatment services should be available to enhance their effectiveness so that ITN use is more acceptable by the community.
3. A means to increase ITN coverage in rural areas should be urgently designed
4. A continuous supply of ITNs should be present with a reasonable cost
5. Further research assessing whether ITNs are equally effective for malaria prevention during low transmission period is required

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Annexes

Annex 1: QUESTIONNAIRE (English Version)

ADDIS ABABA UNIVERSITY

FACULTY OF MEDICINE
DEPARTMENT OF COMMUNITY HEALTH

A questionnaire to assess effectiveness of insecticide-treated ITNs for preventing clinical malaria in children 6-59 months of age

This structured questionnaire is to be interviewer-administered to mothers/caretakers of children whose age is at least 18 years.

Date: _____

Serial number: _____
NAME OF INTERVIEWER: _____

1. *IDENTIFICATION DATA:*
   - 1.1. Name of mother /caretaker of the child_____
   - 1.2. Name of father of the child_____
   - 1.3. Name of child _____
   - 1.4. Status of the child: 1. Regular ITN user 2. Control (Not net user/owner)
   - 1.5. House number given_____
   - 1.6. Kebele_____

2. *SOCIO DEMOGRAPHIC AND ECONOMIC DATA*

S.N	*QUESTIONS*	*CODING*	*SKIP*
201	Age of the mother(in completed years) _____	☐	
202	Place of residence of the mother & child under study 1. Urban 2. Rural	☐ ☐	
203	Date of birth of the child:____/_____/ (day/month/year) Write the exact age of the child (in completed months)_____ and circle the category 1. <12 months 2. 12-23 months 3. 24-35 months 4. 36-47 months 5. 48-59 months	☐ ☐ ☐ ☐ ☐	
204	Sex of the child 1. Male 2. Female	☐ ☐	
205	Number of under five children in the family_____	☐	
206	Number of family in the household_____	☐	
207	Religion of the mother 1. Christian 2. Muslim 3. Traditionalist 4. Others(specify) _____	☐ ☐ ☐ ☐	

208	Marital status of the mother 1. Single 2. Married 3. Divorced 4. Widowed		
209	Sex of head of the household 1. Male 2. Female		
210	Level of education of the mother 1. Illiterate 2. Read and write only 3. Primary (1-6) 4. Secondary (7-10/12) 5. Above secondary level		
211	Level of education of father 1. Illiterate 2. Read and write only 3. Primary (1-6) 4. Secondary (7-10/12) 5. Above secondary level		
212	Occupation of the mother 1. Housewife 2. Merchant 3. Daily laborer 4. *Tela* or other drinks Seller 5. Government employee 6. Other (Specify)_____		
213	Occupation of father living with the mother 1. Farmer 2. Merchant/trader 3. Government employee 4. Daily laborer 5. Other (Specify)_____		
214	Estimated monthly income of the household(Birr) 1. <100 2. 100-299 3. 300-499 4. 500-800 5. >800		
215	Type of Roof of the house: 1. Corrugated iron sheet 2. Thatched roof 3. Other (Specify)_____		
216	Type of wall of the house 1. Mud		

	2. Cemented 3. Only wood(no mud or cement) 4. Other(Specify)_____	☐ ☐ ☐	
217	Type of floor 1. Mud 2. Cement 3. Wood 4. Other(Specify)_____	☐ ☐ ☐ ☐	
218	Number of rooms of the house_____	☐	
219	Do you have bedroom for the family? 1. Yes 2. No	☐ ☐	
220	If yes to question 219, how many bedrooms?_____	☐	
221	Do you have kitchen? 1. Yes 2. No, we cook inside living room 3. No, we cook outside on the open field	☐ ☐ ☐	
222	Do you have a functional radio in the house? 1. Yes 2. No	☐ ☐	
223	Drinking Water source for the family? 1. Pipe water 2. Protected spring 3. Protected Well 4. River 5. Other(Specify)_____	☐ ☐ ☐ ☐ ☐	

3 .Sleeping Patterns

S.N	Questions	Code	*Skip to*
301	Does/do your child (ren) have regular sleeping place? 1. Yes 2. No	☐ ☐	
302	Does your child some times sleep/pass the night outside the house? 1. Yes 2. No	☐ ☐ →	*304*
303	If yes, when was it? 1. During dry seasons (any night with no rain) 2. During hot weather 3. At any time	☐ ☐ ☐	
304	Did your child stay out during the evening times? 1. Yes 2. No	☐ ☐	

305	With whom does/do your child sleep together? 1. Mother 2. Father 3. Older siblings 4. Other (Specify)_____ 5. Alone		
306	Do you keep livestock in the living room during night? 1. yes 2. No		

4. Briefing on knowledge, perceptions and practices on malaria

S.N	*QUESTIONS*	*CODING*	*SKIP*
401	Do you know the cause of malaria? 1. Yes 2. No		→ *403*
402	If yes, what is that / or what are they? 1. Exposure to Cold weather/water 2. Exposure to rain 3. Evil spirit 4. Mosquito bite 5. God's anger 6. A combination of the above_____ 7. Other (specify)_____		
403	Can it be transmitted from one person to another? 1. Yes 2. No 3. Don't know (99)		→ *405* → *405*
404	If yes, how? 1. Mosquito bite 2. Airborne 3. Contact with infected person (touch, sleep or eating together, etc.) 4. Other (Specify)_____ 5. Multiple responses_____		
405	Do you know signs and symptoms of malaria? 1. Yes 2. No		→ *408*
406	If yes, what signs and symptoms of malaria do you know? 1. Fever 2. Chills 3. Headache 4. Backache and generalized aching 5. Loss of consciousness (coma) /convulsion 6. Big mass in the abdomen 7. Other (specify)_____ 8. Multiple responses		

407	What do you think are the severe signs/symptoms of malaria? 1. Convulsion 2. Coma/loss of consciousness 3. Inability to take food/drink 4. Other (specify)_____ 5. Multiple responses 6. Don't know(99)		
408	Do you think that malaria can lead to death of children? 1. Yes 2. No 3. I don't know(99)		
409	Who do you think is more likely to be sick & die of malaria? 1. Children whose age is less than five years 2. Other older children 3. Pregnant women 4. Non pregnant women and adult men 5. Old people 6. Other (Specify)_____ 7. Multiple response_____ 8. I don't know (Not sure)(99)		
410	Do you know the treatments of malaria? 1. Yes 2. No		→ *411*
411	If yes, what are the treatments of malaria? 1. Chloroquine *2. Fansidar®* *3.* Both chloroquine *& Fansidar®* 4. Herbs 5. *Kalicha or Tenkuay* 6. Others (Specify)_____ 7. Multiple response_____ 8. Don't know name of drug(99)		
412	Where & how do you seek treatment when your children are sick with malaria most of the times? 1. I treat at home with chloroquine only 2. I give them at home with fansidar only 3. I treat them at home with chloroquine & *Fansidar®* 4. We take them to government / private clinics 5. Other (Specify)_____		
413	Where did you seek treatment when your child was sick with malaria in the most recent episode? 1. I self treated them at home with Chloroquine 2. I self treated them at home with Fansidar® 3. I self treated them at home with Chloroquine &Fansidar® 4. Treated at government health center or clinic or health post/private clinic 5. Self treated with home remedies 6. Other (Specify)_____ 7. Multiple response_____		

414	Is it possible to prevent malaria? 1. Yes 2. No 3. I don't know (99)		*418* *418*
415	If yes, do you know how to prevent it? 1. Yes 2. No		*418*
416	If yes to Q415, how? 1. DDT spraying 2. Mosquito bed net use 3. Environmental management such as drainage of water 4. Aerosol spraying/use of mosquito coils 5. Spraying the wall and roof with plant preparations(from leaves, roots) 6. A combination of two or more of the above-_____ 7. Other (Specify)_____		
417	What are you currently doing to protect your child and your self from malaria? 1. Nothing 2. DDT spraying 3. Mosquito bed net use 4. Aerosol spraying/use of mosquito coils 5. Use of herbs 6. A combination of two or more of the above_____ 7. Other (Specify)_____		
418	Is your house sprayed with DDT/malathion within the past six months? 1. Yes (if yes check Q415) 2. No 3. I don't know (Not sure)		*501*
419	If yes, have you ever plastered/covered the inside wall of the house with mud, cow dung, cement, etc within 6 months following DDT/Malathion spraying? 1. Yes 2. No		

5. History of malaria in the past four months

501	In the past four months (after the first week of September), did your child have malaria? 1. Yes 2. No		
502	In the past four months (after the first week of September), did your child have other illness? 1. Yes 2. No		

503	If yes, what were the signs and symptoms he/she was experiencing? (Try to hear a spontaneous response by asking to mention some of the symptoms and circle the choices below. If there is no spontaneous response, probe/lead her/him by reading some of the signs/symptoms below) 1. Fever 2. Chills 3. Headache 4. Backache and generalized aching 5. Convulsion 6. Loss of consciousness (coma) 7. Other (specify)_____ 8. Multiple response_____		
504	If no, ask the respondent whether the child was experiencing some of the following signs and symptoms? 1. Fever 2. Chills 3. Headache 4. Backache and generalized aching 5. Loss of consciousness (coma) 6. Convulsion 7. Multiple responses-_____ 8. None of the above		*601* →
505	Did you visited a health institution for illnesses in your under -five child (ren)? 1. Yes 2. No		*508* →
506	What laboratory investigation was done for the child? 1. Blood was taken 2. Stool examination was done 3. Other (Specify)_____ 4. No laboratory investigation was done		
507	What was given for the child? 1. Antimalarials (Mention names if you know it_____) 2. Antibiotics(Mention if you know it_____) 3. Other drugs Specify)_____ 4. Nothing		
508	If the answer was no for Q505, what did you give for the child? 1. Nothing 2. Self-treated it at home with modern anti-malarial drug 3. We took it to the traditional healers 4. Other measures(Specify)_____		

6. ITN use practices

S.N	*QUESTIONS*	*CODING*	*SKIP*
601	Is there a bed net in your house? 1. Yes 2. No		*636* →
602	Condition of ITN(confirm it by observation) 1. Very good condition 2. Medium condition 3. Very old(lots of holes/tears, very dirty, etc)		

	4. Only slices of ITN seen		
603	If yes, write the number of nets in the household_____		
604	If yes to Q601, when did you obtain it (Months)? _____ 1. <6months 2. 6-12 months 3. 13-24 months 4. >24 months	☐	
605	If yes to Q 601, where did you get it? 1. Woreda health office 2. Health center 3. Health post /clinic 4. Shops 5. Other (specify) _____	☐	
606	Did you pay for it? 1. Yes 2. No	☐ →	*608*
607	If yes, how much? (Birr) _____		
608	Was it treated with an insecticide while you obtain it? 1. Yes 2. No 3. I don't know (Not sure)	☐ →	*616*
609	If yes, do you know that the net should be retreated? 1. Yes 2. No	☐ →	*611*
610	If yes, after how many months of the first treatment/retreatment? _____Months		
611	Has your net been ever retreated with an insecticide since its distribution? 1. Yes 2. No	☐ →	*613*
612	If yes, how many times? 1. Once 2. Twice 3. Three times 4. At least four times	☐	
613	When was the last retreatment date? Day/month/year_____ Circle the date. 1. < 6 months 2. 6-12 months 3. > 12 months (>1 year)	☐	
614	Who is doing the retreatment of the net? 1. Self/family member following training 2. Self/family member without training 3. Health worker at health institution 4. Shopkeepers 5. Other (Specify)_____	☐	
615	If the net was retreated more than 6 months back, why didn't you retreat it? 1. Retreatment is expensive (high cost) 2. No money to retreat it 3. Retreatment is not a priority	☐	

	4. Retreatment service isn't available nearby 5. Time inconvenience during retreatment day 6. The insecticide still effective (Is killing mosquitoes, no bite) 7. The insecticide is dangerous (toxic /poisonous) 8. The insecticide has no value (not effective) 9. Other reason (Specify) _____		→ *617*
616	If the net had never been retreated with insecticide, why was that? 1. Was not informed/don't know about retreatment 2. Don't know the benefit of retreatment 3. Fear of toxicity 4. Lack of money 5. Service is not available nearby 6. Time was not convenient during retreatment day 7. Other (Specify)_____		
617	Who is currently sleeping under the net? 1. Under five children (with or without his/her mother) 2. Pregnant woman 3. The father 4. Children > 5 years of age 5. A combination of the above (Specify)_____ 6. Other (Specify)_____		
618	Did the child (ren) sleep under the net the previous night? 1. yes 2. no 3. I don't know (Not sure)		→ *622*
619	Did the user/child regularly sleep under it for the last two weeks? 1. Yes 2. No		→ *622*
620	Did the user/child regularly sleep under it for the last one month? 1. Yes 2. No		→ *622*
621	Did the user/child regularly sleep under it for the last four months? 1. Yes 2. No		→ *623*
622	If the response to Q618-621 is "No ", what were the reasons? 1. No mosquitoes in the room 2. Hot temperature during night 3. Fear of feeling of suffocation/discomfort 4. Child fears sleeping under the net 5. Priority was given for older family members or visitor 6. Unaware of benefit of regular use of ITN 7. Other reasons(Specify)_____ 8. No reason		
623	Do you know the benefit of a mosquito net? 1. Yes 2. No		→ *625*
624	If yes, what are the benefits? 1. Prevents mosquito biting for quite sleep		

	2. Prevents the nuisance by other insects 3. Prevents malaria 4. Gives warmth 5. Other (Specify)_____ 6. Multiple response_____		
625	Is your net initially treated with an insecticide? (Check Q607) 1. Yes 2. No 3. I don't know		→ *625* → *627*
626	If yes, do you know the name of the insecticide? 1. Yes 2. No If yes, write the name of the insecticide. Name _____		
627	Do you think insecticide treated bed net is more effective than untreated one? 1. Yes, it is more effective throughout 2. No. It is equally effective 3. I didn't observe the difference 4. It was more effective initially. But as the days passed, mosquitoes enter the room and bite persons and no dead mosquitoes seen even before six months 5. Other (Specify)_____		
628	If the respondent said it is more effective, why it is so? 1. I observe many mosquitoes dead on the floor, bed and the net 2. No bite at all while sit in home or asleep at bed even without a net 3. No bite only while asleep under the net 4. The child has no any or only fevers or malaria fevers than previously 5. No mosquitoes enter the room 6. Combination of two or more of the above 7. Other (Specify)_____		
629	How frequent do you wash the bed net in the 6 months period? 1. Never 2. Only once just before retreatment 3. Twice 4. 3-5 times 5. 6 or more times		→ *631*
630	With what do you wash it? 1. Soap and water 2. Water only 3. Kerosene/benzene 4. *Barekina* 5. Other (Specify) _____		
631	Do you know that frequent washing can reduce the efficacy of treated bed net? 1. Yes 2. No		
632	If the response to 629 is either 3 or 4 or 5, why did you frequently wash the net? 1. The net becomes easily dirty 2. The child usually soils the net with feces and urine 3. Fear of toxicity of children while asleep 4. Other (Specify)_____		

633	Does the child's ITN have tears/hole? 1. Yes 2. No	☐ ☐	
634	If yes, how many holes/tears does it have? _____		
635	Did your child sometimes roll out from the net during night time? 1. Yes 2. No		
636	If the household/family did not own at least one net, what are the reasons? 1. Not heard about the use of a ITN for malaria prevention 2. ITNs are not effective for malaria prevention 3. Aware its importance but it is costly(expensive) 4. Aware its importance but the supply is not enough despite willingness to purchase 5. Other(Specify)_____	☐ ☐ ☐ ☐ ☐	
637	Do you think that the current price of ITNs is expensive? 1. Yes, very expensive 2. Not as such expensive 3. Very cheap	☐ ☐ ☐	
638	How much do you want to pay for ITN?_____(Birr)		
639	Do you support that ITNs be given freely? 1. Yes 2. No, it shouldn't		
640	Should the retreatment service be provided without charge? 1. Yes 2. No		

Fill the following by observing the ITNs

1. Number of ITNs in the household-_____
2. Size of ITNs a. Small b. Medium 3. Large
3. Shape of ITNs a. Rectangular b. Conical
4. Is there hanging place for the ITN over the sleeping place of the child? a. Yes b. No
5. Do see the ITN hanged above the bed? a. Yes b. No
6. Number of holes in the ITN? _____
7. Cleanliness of the ITN: a. Good b. Dirty
8. General condition of the ITN: a,. Good- Very good status b. Very old and ragged c. Put closed/hanged without use d. Thrown as it was old e. Other(Specify)_____

Annex 2: Amharic Version of the Questionnaire

አዲስ አበባ ዩኒቨርሲቲ
ሕክምና ፋኩልቲ
የህብረተሰብ ጤና ትምህርት ክፍል

የወባ ትንኝ መከላከያ አጎበርን እድሜያቸው ከአምስት አመት በታች(ከ6ወር እስከ 59 ወር) የሆነ ህጻናት ሲጠቀሙበት ወባን የመከላከል ሀይሉን ለማጥናት የተዘጋጀ መጠይቅ

ይህን መጠይቅ የሚጠየቁት የህጻኑ እናት ወይም እድሜው ከአስራ አምስት አመት በላይ የሆነ የሁልጊዜ ተንከባካቢ (አሳዳጊ) መሆን አለበት

ቀን:----------

የመጠይቁተ.ቁ. ----------
የጠያቂው ስም----------

2. የተጠያቂዎች ማንነት መለያ

2.2. የህጻኑ እናት ስም----------
2.3. የህጻኑ አባት ስም----------
2.4. የህጻኑ ስም----------
2.5. ህጻኑ የተመረጠበት ሁኔታ:
1. የወባ አጎበር ተጠቃማ(ያለው). 2. የወባ አጎበር የማይጠቀም(የሌለው)
2.6. የተሰጠው የቤት ቁጥር----------
2.7. ቀበሌ----------

ክፍል 2: ማህበራዊና ኢኮኖሚያዊ ሁኔታ

ተ.ቁ.	*ጥያቄዎች*	*መለያ(ኮድ)*	*የሚቀጥለው ጥያቄ*

201	**የእናት(ያሳዳጊ/ተንከባካቢ) እድሜ(ባለፈው የልደት ዘመናቸው)----------(ዓመት)**	☐	
202	የእናት/ያሳዳጊ/ተንከባካቢና የህጻኑ መኖሪያ ቦታ 3. ከተማ 4. ገጠር	☐ ☐	
203	**ህጻኑ የተወለደበት ቀን----------ወር---------ዓ.ም(ቀጥሎ የህጻኑ እድሜ ባለፈው የልደት ዘመኑ ስንት እንደነበር በወራት ጻፍ/ፊ:----------ወር ከየትኛው የእድሜ ክልል እንደሚገኝ ከሚከተሉት ትክክለኛውን ክበብ** **6. ከ12 ወር በታች** **7. 12-23 ወር** **8. 24-35 ወር** **9. 36-47 ወር** **10. 48-59 ወር**	☐ ☐ ☐ ☐ ☐	
204	የህጻኑ ፆታ 3. ወንድ 4. ሴት	☐ ☐	
205	ቤተሰቡ ጋር የሚኖሩ እድሜያቸው ከአምስት አመት በታች የሆኑ ህፃናት ቁጥር ስንት ነው?----------	☐	
206	**የቤተሰብ ብዛት ስንት ነው?----------**	☐	
207	**የእናት/ያሳዳጊ ሀይማኖት ምንድን ነው?** **5. ክርስቲያን** **6. እስላም** **7. ባህላዊ እምነት** **8. ሌላ(ግለጥ/ጭ) ----------**	☐ ☐ ☐ ☐	
208	**በአሁኑ ሰዓት ያለው የእናት(ያሳዳጊ/ተንከባካቢ) የጋብቻ ሁኔታ** **5. ያላገባ/ች** **6. ያገባ/ች** **7. የፈታ/ች** **8. የትዳር ጓደኛ የሞተበት/ባት**	☐ ☐ ☐ ☐	
209	**የቤተሰቡ ሀላፊ ፆታ** **3. ወንድ** **4. ሴት**	☐ ☐	
210	**እናት/አሳዳጊ/ተንከባካቢ ያለው ከፍተኛ የትምህርት ደረጃ** **6. አልተማሩም** **7. ማንበብና መፃፍ ብቻ** **8. የመጀመሪያ ደረጃ (1-6)** **9. ሁለተኛ ደረጃ (7-10/12)** **10. ከሁለተኛ ደረጃ በላይ (ግለጥ/ጭ)----------**	☐ ☐ ☐ ☐ ☐	
211	**አባት ያለው ከፍተኛ የትምህርት ደረጃ** **1. አልተማሩም** **2. ማንበብና መፃፍ ብቻ** **3. የመጀመሪያ ደረጃ (1-6)** **4. ሁለተኛ ደረጃ (7-10/12)** **5. ከሁለተኛ ደረጃ በላይ(ግለጥ/ጭ)----------**	☐ ☐ ☐ ☐ ☐	
212	የእናት /ተንከባካቢ/ያሳዳጊ ቋሚ ስራ 7. የቤት እመቤት 8. ነጋዴ 9. የቀን ሰራተኛ 10. ጠላ ወይም ሌሎች መጠጦችን መሸጥ 11. የመንግስት ሰራተኛ 12. ሌላ(ግለጥ/ጭ)----------	☐ ☐ ☐ ☐ ☐ ☐	

213	ከእናት ጋር የሚኖሩት አባት ቋሚ ስራ 6. አርሶ አደር/ገበሬ 7. ነጋዴ 8. የመንግስት ሰራተኛ 9. የቀን ሰራተኛ 10. ሌላ(ግለጥ/ጭ)----------		
214	የቤተሰቡ ወርሃዊ ገቢ በግምት (በብር ሲሰላ) 6. ከ100 ብር በታች 7. 100-200 ብር 8. 300-500 ብር 9. 500-800ብር 10. ከ800 ብር በላይ		
215	የህፃኑ መኖሪያ ቤት ጣራ የተሰራው ከምንድን ነው? 4. ከቆርቆሮ 5. እሳር 6. ሌላ(ግለጥ/ጭ)----------		
216	የህፃኑ መኖሪያ ቤት ግድግዳ የተሰራው ከምንድን ነው? 5. ጭቃ(አፈር) 6. ሲሚንቶ 7. እንጨት ብቻ 8. ሌላ(ግለጥ/ጭ)----------		
217	የህፃኑ መኖሪያ ቤት ወለል ንጣፍ ምንድን ነው? 1. ጭቃ(አፈር) 2. ሲሚንቶ 3. እንጨት 4. ሌላ(ግለጥ/ጭ)----------		
218	መኖሪያ ቤታችሁ ስንት ክፍል አለው?----------		
219	የተለየ የመኝታ ክፍል አላችሁ? 1. አዎ አለን 2. የለንም		
220	መልስዎ አዎ አለን ከሆነ ስንት የመኝታ ክፍል አላችሁ?----------		
221	ከመኖሪያ ቤቱ የተለየ ማእድ ቤት አላችሁ? 1. አዎ አለን 2. የለንም ውስጥ ከመኖሪያ ቤቱ ወስጥ ነው የምናበስለው 3. የለንም ከውጭ (ሜዳ ላይ) ነው የምናበስለው		
222	የሚሰራ ሬዲዮ ቤታችሁ ውስጥ አሌ 3. አዎ አለን 4. የለንም		
223	ቤተሰቡ ለመጠጥ ዉሃ የሚቀዳው ከየት ነው፡ 6. ከቧንቧ 7. ከታጠረ ምንጭ 8. ክዳን ካለው ጉድጓድ 9. ከወንዝ 10. ሌላ(ግለጥ/ጭ)----------		

ክፍል 3: የህጻኑ አተኛኘ ሁኔታ

ተ.ቁ	ጥያቄዎች	መለያ(ኮድ)	*የሚቀጥለው ጥያቄ*
301	ይህ ልጅዎ(ጆችዎ) ቋሚ የሆነ የመኝታ ቦታ አለው(ላት) ወይ? 3. አዎ አለው(ላት) 4. የለም		
302	ባለፉት 3 ወራት ልጅዎ አንዳንዴ ከቤት ውጭ ያ(ታ)ድር ነበር ወይ?		→

	3. አዎ ያ(ታ)ድር ነበር 4. ውጭ አድሮ(ራ) አያ(ታ)ውቅም		*304*
303	መልስዎ አዎ ከሆነ መቸ መቸ ነው? 4. ዝናብ በሌለ(ብራበሆነ) ጊዜ ሁሉ 5. በማንኛውም የሙቀት ጊዜ ሁሉ 6. በማንኛውም ሌሊት	☐ ☐ ☐	
304	ይህ ልጅዎ አንዳንዴ ከቤት ውጭ ያ(ታ)መሸ ነበር ወይ? 3. አዎ ያ(ታ)መሸ ነበር 4. አያ(ታ)መሸም(አምሽተው አያውቁም)	☐ ☐	
305	ይህ ልጅዎ ብዙውን ጊዜ ከማን ጋር ነው የሚያድረው(የሚተኛው)(የምታድረው)? 6. ከእናቱ(ቷ) ጋር 7. ከአባቱ(ቷ) ጋር 8. ከእህት(ወንድም) (ታላቅ/ታናሽ)ጋር 9. ከሌላ ሰው ጋር(ግለጥ/ጭ)---------- 10. ብቻው(ዋን)	☐ ☐ ☐ ☐ ☐	
306	የቀንድ ከብቶች ህፃኑ(ኗ) ከሚያድርበት ክፍል ያድራሉ ወይ? 3. አዎ ያድራሉ 4. አያድሩም	☐ ☐	

ክፍል 4: ተጠያቂዎች ስለወባ ያላቸው እውቀት እይታና ድርጊት

ተ.ቁ	*ጥያቄዎች*	*መለያ(ኮድ)*	*የሚቀጥለው ጥያቄ*
401	የወባ በሽታ ምክንያት ምን እንደሆነ ያውቃሉ? 3. አዎ አውቃለሁ 4. አላውቁም	☐ ☐ →	*403*
402	መልስዎ አዎ አውቃለሁ ከሆነ፡ እንዴት ይይዘዋል? 8. በቅዝቃዜ ሰዓት ውጭ መቆየት ወይም በቀዝቃዛ ውሃ መታጠብ/መነከር 9. ዝናብ ሲደበድብ 10. የሰው አይን/ቡዳ ሲበላው 11. በቢንቢ ሲነደፍ(ሲነክስ) ብቻ 12. የበሽታው አምጭ ህዋስ በትንኝ ንክሻ ወደ ሰውነታችን ሲገባ 13. የእግዜአብሄር ቁጣ 14. ከላይ በተጠቀሱት ከአንድ በላይ ምክንያቶች (ምርጫዎቹን ፃፍ)---------- 15. ሌላ(ግለጥ/ጭ)----------	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	
403	የወባ በሽታ ከበሽተኛ ወደ ጤነኛ ሰው ሊተላለፍ ይችላል ወይ 4. አዎ ይተላለፋል 5. አይተላለፍም 6. አላውቅም (99)	☐ ☐ → ☐ →	*405* *405*
404	መልስዎ አዎ ከሆነ እንዴት ነው ሊተላልፍ የሚችለው? 1. በትንኝ ንክሻ 2. በትንፋሽ 3. ከወባ በሽተኛ ጋር በመነካካት፡ አብሮ በመተኛት፤ በመብላት ወዘት 4. በሌላ መንገድ (ግለጥ/ጭ)---------- 5. ከላይ በተጠቀሱት ከአንድ በላይ መንገዶች (ምርጫዎቹን ፃፍ)----------	☐ ☐ ☐ ☐	

405	**የወባ በሽታ ምልክት(ቶች) ምን (ምን) እንደሆነ(ኑ) ያውቃሉ** **1. አዎ፤አውቃለሁ** **2. አላውቅም(99)**		→ ***408***
406	***መልስዎ አውቃለሁ ከሆነ ምን ምን ናቸው?*** ***9. ትኩሳት(የሰውነት ሙቀት መጨመር)*** ***10. ብርድ ብርድ ማለት(በብርድ መንቀጥቀጥ)*** ***11. ራስ ምታት*** ***12. ሰውነትን መቆረጣጠም ለምሳሌ ወገብ እጅ እግር ወዘተ.....*** ***13. የሰውነት መንዘፍዘፍ፤ራስን መሳት(ኮማ)*** ***14. ሆድ ውስጥ ያበጠ ነገር መውጣት*** ***15. ሌላ ምልክት(ግለጥ/ጭ)----------*** ***16. ከላይ በተጠቀሱት ከአንድ በላይ ምልክቶች (ምርጫዎቹን ፃፍ)----------***		
407	**ህፃኑ የያዘው ወባ በጣም አደገኛ መሆኑን የሚያሳዩት ምልክቶች ምን ምን ናቸው?** **7. የሰውነት መንዘፍዘፍ፡** **8. ራስን መሳት(ኮማ)** **9. ተደጋጋሚ ትውከት** **10. ምግብ/መጠጥ መውሰድ አለመቻል** **11. ሌላ ምልክት(ግለጥ/ጭ)----------** **12. ከላይ በተጠቀሱት ከአንድ በላይ ምክንያቶች (ምርጫዎቹን ፃፍ)---------** **13. አላውቅም(99)**		
408	**የወባ በሽታ ህፃናቱን ሊገድል ይችላል** **4. አዎ ሊገድል ይችላል** **5. ሊገድል አይችልም** **6. ይግደል አይግደል አላውቅም(99)**		
409	**የትኞዎቹ የህብረተሰብ ክፍሎች ናቸው በወባ በሽታ በቶሎ ሊታመሙና ሊሞቱ የሚችሉት?** **9. እድሜያቸው ከ5 ዓመት በታች የሆነ ህጻናት** **10. ከአምስት አመት በላይ የሆኑ ህጻናት** **11. ነፍሰ ጡር(እርጉዝ) ሴቶች** **12. ነፍሰ ጡር(እርጉዝ) ያለሆኑ ትልልቅ ሴቶች ወይም ወንዶች** **13. ያረጁ ሰዎች** **14. ሌሎች ሰዎች(ግለጥ/ጭ)----------** **15. ከላይ በተጠቀሱት ከአንድ በላይ ምክንያቶች (ምርጫዎቹን ፃፍ)---------** **16. አላውቅም (እርግጠኛ አይደለሁም)(99)----------**		
410	**የወባ ህክምና(ወባ ለያዘው ሰው የሚሰጠው) ምን እንደሆን ያውቃለ(ስሙን የማያውቁ ከሆነ መልኩን ቁጥሩንና ቅርጹን ጻፍ)----------** **9. ክሎሮኪን** ***10. ፋንሲደር*** **11. ክሎሮኪንና ፋንሲደር** **12. ስራስር/ቅጠላቅጠል** ***13. ወደ ቃልቻ/ጠንቋይ መውሰድ*** **14. ሌላ (ግለጥ/ጭ)----------** **15. ስሙን አላውቅም (99)**		
411	**ልጅዎ(ችዎ) ወባ ሲታመም ብዙውን ጊዜ ምንድን ነው የሚያደርጉት?** **6. ከሱቅ/ፋርማሲ ክሎሮኪን ብቻ ገዝቶ ቤት ውስጥ**		

	አውጣቸዋለሁ 7. ከሱቅ/ፋርማሲ ፋናሲደር ብቻ ገዝቸ ቤት ውሰጥ አውጣቸዋለሁ 8. ሁለቱንም ገዝቸ አውጣቸዋለሁ 9. ህመምተኛውን ወደ ጤና ተቋማት እንወስደዋለን፡ ሀኪም ቤት የታዘዘለትን መድሀኒት እንሰጠዋለን 10. ሌላ (ግለጥ/ጭ)----------	☐ ☐	
412	ልጅዎ በቅርቡ በወባ ታሞ ሳለ ምን ነበር ያደረጉት? 8. ከሱቅ/ፋርማሲ ክሎሮኪን ብቻ ገዝቸ(ን) ቤት ውሰጥ ሰጠሁት(ነው) 9. ከሱቅ/ፋርማሲ ፋናሲደር ብቻ ገዝቸ(ን) ቤት ውሰጥ ሰጠሁት(ነው) 10. ከሱቅ/ፋርማሲ ሁለቱንም ገዝቸ(ን) ቤት ውሰጥ ሰጠሁት(ነው) 11. ህመምተኛውን ወደ ጤና ተቋማት ወስጀ(ደን)፡ ሀኪም ቤት የታዘዘለትን የወባ መድሀኒት አዋጥነው 12. ቤት ውስጥ ያዘጋጀሁትን መድሀኒት ሰጠሁት 13. ሌላ (ግለጥ/ጭ)---------- 14. ከላይ በተጠቀሱት ከአንድ በላይ ህክምናዎች (ምርጫዎቹን ፃፍ)----------	☐ ☐ ☐ ☐ ☐ ☐ ☐	
413	ወባን መከላከል ይቻላል? 4. አዎ መከላከል ይቻላል 5. መከላከል አይቻልም 6. አላውቅም(እርግጠኛ አይደለሁም)(99)	☐ ☐ ☐	*416* *416*
414	መልስዎ አዎ ከሆነ፡ እንዴት መከላከል እንደሚቻል ያውቃሉ? 1. አዎ አውቃለሁ 2. አላውቅም (99)	☐ ☐	*416*
415	የጥያቄ 414 መልስዎ አዎ ከሆነ፡ እንዴት ነው መከላከል የሚቻለው? 8. ዲዲቲ/ማላታይን ርጭት 9. የአልጋ አጎበር በመጠቀም 10. አካባቢን በማፅዳት፡ያቆረ ውሃን በማስወገድ ወዘተ..... 11. ቤትን ፍሊት መርጨት፡ 12. ከሱቅ የሚገዙ ወይም ሌሎች ነገሮችን ማጨስ 13. ስራስርን/ቅጠላቅጠልን ወቅጦ ግድግዳን፡ጣራን መርጨት 14. ከላይ ከተጠቀሱት ከአንድ በላይ ድርጊቶች(ምርጫዎቹን ፃፍ)---------- 15. ሌላ ዘዴ(ጥቀስ/ፃፍ)----------	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	
416	ልጆችዎን፡ ራስዎንና ሌላውን የቤተሰብ አባል ከወባ በሽታ ለመጠበቅ ምን እያደረጉ ነው 8. ምንም እያደረግኩ አይደለም 9. ቤታችን ዲዲቲ/ማላታይን ርጭት ተደርጎለታል 10. የአልጋ አጎበር በመጠቀም 11. ቤቱን ፍሊት በመርጨት፡ ከሱቅ የሚገዙ ሌሎች ነገሮችን በማጨስ ላይ ነን 12. ስራስርን/ቅጠላቅጠልን ወቅጠን ግድግዳን፡ጣራን በመርጨት ላይ ነን 13. ከላይ ከተጠቀሱት ከአንድ በላይ ድርጊቶች(ምርጫዎቹን ፃፍ)---------- 14. ሌላ ዘዴ (ጥቀስ/ፃፍ)----------	☐ ☐ ☐ ☐ ☐ ☐ ☐	
417	ቤታችሁ ባለፉት ስድስት ወራት ወዲህ ውስጥ የዲዲቲ/ማላታይን ርጭት ተደርጎለታል? 4. አዎ ተደርጎለታል(የጥያቄ415 መልስን አስተካክል) 5. ርጭት አልተደረገለትም	☐ ☐	*501*

418	**መልስዎ አዎ ርጭት ተደርጎለታል ከሆነ፡የውስጠኛውን የቤትዎን ግድግዳ በጭቃ፡በከብቶች እዳሪ ወዘተ... ርጭት ከተደረገለት ወዲህ ቀብተውት ያውቃሉ** **3. አዎ ተቀብቷል** **4. አልተቀባም** **5. እርግጠኛ አይደለሁም**	☐ ☐ ☐	

ክፍል 5፡ ባለፉት ሶስት ወራት ህፃኑ ላይ የታየ የወባ በሽታ ሁኔታ

501	**ባለፉት ሶስት ወራት (ከመስከረም የመጀመሪያው ሳምንት ወዲህ)፡ልጅዎ በወባ በሽታ ታሞ ያውቃል?** **3. አዎ ታሞ ነበር** **4. ታሞ አያውቅም**	☐ ☐	
502	**ልጅዎ ሌላ ህመምስ ታሞ ነበር ወይ?** **1. አዎ፡ ታሞ ነበር** **2. ታሞ አያውቅም**	☐ ☐	
503	**መልስዎ አዎ ታሞ ነበር ከሆነ፡ ምን ምን ምልክቶች ነበሩት(ተጠያቂው በራሱ እንዲናገር ጊዜ ስጥ፡ ነገር ግን ራሱ ፈጥኖ ለመጥራት/ማስታወስ ካልቻለ አንድ ሁለት ምልክቶችን ጥራና መኖር አለመኖሩን መርምር)** **1. ትኩሳት(የሰውነት ሙቀት መጨመር)** **2. ብርድ ብርድ ማለት(በብርድ መንቀጥቀጥ)** **3. ራስ ምታት** **4. ሰውነትን መቆረጣጠም ለምሳሌ ወገብ እጅ እግር ወዘተ.....** **5. የሰውነት መንዘፍዘፍ** **6. ራስን መሳት(ኮማ)** **7. ሌላ ምልክት(ግለጥ/ጭ)----------**	☐ ☐ ☐ ☐ ☐ ☐ ☐	***505***
504	**መልስዎ ታሞ አልነበረም ከሆነ፡የሚከተሉትን ምልክቶች እያንዳንዱን ተራ በተራ በማንበብ ጠይቅ?** **9. ትኩሳት(የሰውነት ሙቀት መጨመር)** **10. ብርድ ብርድ ማለት(በብርድ መንቀጥቀጥ)** **11. ራስ ምታት** **12. ሰውነትን መቆረጣጠም ለምሳሌ ወገብ እጅ እግር ወዘተ.....** **13. የሰውነት መንዘፍዘፍ** **14. ራስን መሳት(ኮማ)** **15. ምንም ምልክት የለም**	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ →	***601***
506	**ልጅዎ ታሞ በነበረበት ወቅት፡ወደ ዘመናዊ የጤና ተቋማት ወስደውት ነበር?** **3. አዎ ወስጀው ነበር** **4. አልወሰድኩትም**	☐ ☐ →	***509***
507	**ምን አይነት የላቦራቶሪ ምርመራ ተደርጎለት ነበር?** **5. የደም ምርመራ** **6. የሽንት(ና)/ ሰገራ ምርመራ ተደርጎለታል** **7. ሌላ የላቦራቶሪ ምርመራ(ጥቀስ/ሽ)----------** **8. ምንም አይነት የላቦራቶሪ ምርመራ አልተደረገለትም**	☐ ☐ ☐ ☐	
508	**ለልጅዎ ምን አይነት መድሀኒት ተሰጠው፡** **5. የወባ መድሀኒቶች(ኪኒን)(ስሙን የሚያውቁት ከሆነ ይጥቀሱ----------)** **6. አንቲባዮቲክስ(ለምሳሌ አምፒሲሊን፡ ወዘተ...)** **7. ሌላ ህክምና (ጥቀስ)----------** **8. የመድኒቱን ስም አላውቅም(99)**	☐ ☐ ☐ ☐	***601***

509	**የጥያቄ 504 መልስዎ፡ ወደ ሀኪም ቤት አልወሰድኩትም ከሆነ፡ምን ሰጡት?** **5. ምንም አይነት ነገር አላደረገንም** **6. ዘመናዊ የወባ ኪኒኖችን ገዝቸ ሰጠሁት(ስሙን ፃፍ----------)** **7. ባህላዊ ህክምና ተደረገለት** **8. ሌላ እርዳታ ተደረገለት(ጥቀስ)----------**		☐ ☐ ☐ ☐	

ክፍል 6፡ የአልጋ አጎበር አጠቃቀም ሁኔታ

ተ.ቁ	***ጥያቄዎች***	***መለያ (ኮድ)***	***የሚቀጥለው ጥያቄ***
601	**የአልጋ አጎበር ቤታችሁ ውስጥ አለ?** **3. አዎ አለን (እንዲያሳዩህ/ሽ በትህትና ጠይቅ)** **4. የለንም**	☐ ☐ →	 ***636***
602	**የአለው የአልጋ አጎበር ሁኔታ (በማየት)** **1. በጣም ደህና** **2. መካከለኛ ሁኔታ** **3. በጣም አሮጌ (ብዙ ቀዳዳ ያለው፡ በጣም ቁሽሽ ያለ)** **4. ያጎበሩ ቁራጭ ብቻ ነው ያለው**	☐ ☐ ☐ ☐	
603	**መልስዎ አዎ አለን ከሆነ፡ስንት አጎበር እንዳለ በቁጥር ፃፍ----------**	☐	
604	**የ601 መልስዎ አዎ አለን ከሆነ፡ መቸ ገዛችት(ተሰጣችሁት)(በወራት)?** **ወር----------ዓ.ም (ከየትኛው ጋር እንደሚመደብ ክበብ)** **5. ከዛሬ 6ወር ወዲህ** **6. ከዛሬ 6-12 ወር** **7. ከ13-24 ወር** **8. ከ24 ወር በላይ**	☐ ☐ ☐ ☐	
605	**አጎበሩን የት አገኙት/ገዙት?** **6. ወረዳ ጤና ጥበቃ ጽ/ቤት** **7. ጤና ጣቢያ** **8. ክሊኒክ/ጤና ኬላ** **9. ሱቅ** **10. ሌላ (ጥቀስ)----------**	☐ ☐ ☐ ☐ ☐	
606	**ለአጎበሩ ገንዘብ ከፈላችሁበት፤** **3. አዎ** **4. አልከፈልንም**	☐ ☐ →	 ***608***
607	**ስንት ብር----------**		
608	**ሲገዙት/ሲሰጥዎት ቅድሚያ በመድሀኒት ተነክሮ ነበር ?** **4. አዎ** **5. አልተነከረም** **6. አላውቅም(እርግጠኛ አይደለሁም)(99)**	☐ ☐ ☐ →	 ***616*** ***616***
609	**የ607 መልስዎ አዎ ከሆነ፤አጎበሩ ዳግም መነከር እንዳለበት ያውቃሉ?** **1. አዎ** **2. አላውቅም**	☐ ☐ →	 ***611***
610	**መልስዎ አዎ ከሆነ፡ በየስንት ወሩ ነው መነከር ያለበት?በየ----------ወሩ**	☐	
611	**የእርስዎን ያልጋ አጎበር እንደገና አስነክረውት ያዉቃሉ?** **3. አዎ**	☐ ☐ →	

	4. አላውቅም		***613***
612	**መልስዎ አዎ ከሆነ፡ ስንት ጊዜ?** **5. አንድ ጊዜ ብቻ** **6. ሁለት ጊዜ** **7. ሶስት ጊዜ** **8. ቢያንስ አራት ጊዜ**	☐ ☐ ☐ ☐	
613	**አጎበርዎ ለመጨረሻ ጊዜ የተነከረብትን ቀን ያውቁታል? ቀን------/ወር-----/ዓ.ም----------(ከሚከተሉት አንዱን ክበብ)** **4. ከስድስት ወር ያነሰ** **5. ከ6-12 ወር** **6. ከ12 በላይ**	☐ ☐ ☐	
614	**ማነው የአጎበሩን ነከራ የሚያካሂደው?** **6. ስልጠና የተሰጠው የቤተሰብ አባል ወይም ተጠያቂው** **7. ስልጠና ያልተሰጠው የቤተሰብ አባል ወይም ተጠያቂው** **8. የጤና ባለሞያዎች** **9. ባለሱቆች** **10. ሌላ(ጥቀስ)----------**	☐ ☐ ☐ ☐ ☐	
615	**የጥያቄ 613 መልስን ተመልከት፡፡ አጎበሩ ከ6 ወር በፊት ዳግም በመድሀኒት ከተነከረ ለምንድን ነው እስካሁን እንደገና ያላሰነከሩት?** **10. ማስነከሪያ ዋጋው በጣም ውድ ስለሆነ** **11. እንደገና ማስነከር ቅድሚያ የምንሰጠው ጉዳይ አይደለም** **12. የእንደገና ነከራ አገልግሎቱ በአቅራቢያችን የለም** **13. ነከራ የሚካሄድበት ጊዜ አመቺ አልነበረም** **14. መድሀኒቱ አሁን ድረስ በደንብ ይከላከላል (የታመመም የለም) የሚነከረው መድሃኒት ለጤናችን በጣም አስጊ ነው(መርዛማ ነው)** **15. በመድሃኒት መንከሩ ጥቅም የለውም(ቢንቢዎቹን አይገላቸውም፡አጎበር የሚጠቀሙትም ይታመማሉ** **16. ሌላ ምክንያት(ጥቀስ)----------**	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	→ ***617***
616	**አጎበሩ ካሁን በፊት አንድስ ቀን እንኳ እንደገና ተነክሮ የማያውቅ ከሆነ፡ ለምንድን ነው?** **8. እንደገና መነከር እንዳለበት አናውቅም(አልተነገረንም)** **9. እንደገና የመነከሩን ጠቀሜታ አናውቅም** **10. መድሀኒቱ ልጆቻችን እንዳይመርዛቸው በመፍራት** **11. ለማስነከሪያ የምንከፍለው ገንዘብ ስሌለን** **12. የመድሀኒት ነከራ አገልግሎቱ በቅርባችን ስለማይሰጥ** **13. የመድሀኒት ነከራ የሚካሄድበት ጊዜ አመች አልነበረም** **14. ሌላ ምክንያት(ጥቀስ/ሽ)----------**	☐ ☐ ☐ ☐ ☐ ☐ ☐	
617	**ከአለፉት አራት ወራት(መስከረም -ታህሳስ) ጀምሮ ማን ነው አጎበሩን እየተጠቀመበት(ከታች እየተኛበት) ያለው?** **7. እድሜያቸው ከ5 ዓመት በታች የሆናቸው ህፃናት(ብቻቸውን ወይም ከእናታቸው ጋር)** **8. ነፍሰጡር ሴቶች** **9. የልጆች አባት(አባውራው)** **10. እድሜያቸው ከ5 ዓመት በላይ የሆናቸው ልጆች** **11. የተለያዩ አይነት የቤተሰቡ አባላት (በቋሚነት የሚተኛበት የቤተሰብ አባል የለም) (ጥቀስ)----------** **12. ሌላ ሰው (ጥቀስ)----------**	☐ ☐ ☐ ☐ ☐ ☐ ☐	

618	ልጁ ትናንት ሌሊት አጎበሩን ተጠቅሞበታል(ካጎበሩ ስር ተኝቶ ነው ያደረው)? 4. አዎ ተጠቅሞበታል 5. አልተጠቀመበትም (ካጎበሩ ሥር አላደረም)	☐ ☐	
619	ለአለፉት ሁለት ሳምንታት ልጅዎ ያልጋ አጎበሩን ይጠቀምበት ነበር? 3. አዎ 4. ሁልጊዜ አልተጠቀመበትም	☐ ☐	
620	ያለፈውን አንድ ወር ሙሉ ይህ ልጅዎ አጎበሩን ተጠቅሞበታል? 3. አዎ 4. ሁልጊዜ አልተጠቀመበትም	☐ ☐	
621	ልጅዎ አንድ ቀን እንኳ ሳያቋርጥ የአልጋ አጎበሩን ላለፉት አራት ወራት ሲጠቀምበት ነበር? 1. አዎ 2. ሁልጊዜ አልተጠቀመበትም	☐ ☐	→ *623*
622	ከ 618-621 ካሉት ጥያቄዎች ያንዱ ወይም ከዚያ በላይ ያሉት መልስ(ሶች) አልተጠቀመም ከሆነ፡ ምክንያቱ ምንድን ነው? 9. ትንኝ ቤት ውስጥ ሰለሌለ 10. ሌሊቱ በጣም ሙቀት ስለነበር 11. ከአጎበሩ ስር ህፃኑ ሲተኛ ጭንቅ ስለሚለው 12. ልጁ ለመተኛት ስለሚፈራ (አልተኛም ስለሚል) 13. ቅድሚያ ለታላላቆች ወይም ለእንግዶች ስለምንሰጥ 14. ሁልጊዜ አጎበር የመጠቀምን ጥቅም ስለማናውቅ 15. ሌላ ምክንያት (ጥቀስ/ሽ)---------- 16. ይህ ነው የሚባል ምክንያት የለንም	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	
623	የአልጋ አጎበር መጠቀም ጥቅሙ ምን እንደሆነ በትክክል ያውቃሉ? 3. አዎ አውቃለሁ 4. አላውቅም	☐ ☐	→ *625*
624	መልስዎ አዎ አውቃለሁ ከሆነ፡ ጠቀሜታው ምንድን ነው? 7. የትንኝ ንክሻ ስለሚከላከል ሰላም ያለው እንቅልፍ ለመተኛት ይረዳል 8. የሌሎች ነፍሳት ንክሻን ወይም ረብሻን ይከላከላል 9. ወባን ለመከላከል ይረዳል 10. ሙቀት ይሰጣል 11. ሌላ ምክንያት(ጥቀስ/ሽ)----------	☐ ☐ ☐ ☐ ☐	
625	የልጅዎ የአልጋ አጎበር ሲገዙት/ሲሰጥዎት በመድሀኒት ተነክሮ ነበር?(የጥያቄ 607ን መልስ ተመልከትና አስተካክል) 4. አዎ ተነክሮ ነበር 5. አልተነከረም 6. ይነከር አይነከር አላውቅም (99)	☐ ☐ ☐	→ *627* *627*
626	መልስዎ አዎ ተነክሮ ነበር ከሆነ ፡ የመድሀኒቱን ስም ያውቁታል? 3. አዎ፡፡ የመድሀኒቱ ስም---------- 4. አላውቅም	☐ ☐	
627	በመድሀኒት የተነከረ አጎበር ካልተነከረው አጎበር በበለጠ ወባ ይከላከላል ብለው ያስባሉ? 6. አዎ፡ ይበልጥ ወባን ይከላከላል 7. ሁለቱም ልዩነት የላቸውም 8. ልዩነቱን አላስተዋልኩም(99) 9. መጀመሪያ አካባቢ ይበልጥ ነበር፡፡ ነገር ግን እየቆየ(ስድስት ወር እንኳ ሳይሞላ)፡ ትንኞች ቤት ውስጥ በመግባት ይነድፋሉ፤ የሞቱም ትንኞች	☐ ☐ ☐ ☐ ☐	

	ወለል ወይምአጎበሩ ላይ ሞተው አላይም። 10. ሌላ አስተያየት ካለ ይጥቀሱ----------		
628	የተጠያቂው መልስ አዎ ወባን ይከላከላል፡ ለምን ? 8. ብዙ የሞቱ ትንኞችን ወለሉ ላይ ወይምአጎበሩ /አልጋው ላይ ሞተው አያለው። 9. ምንም አይነት የትንኝ ንክሻ ቤታችን ውስጥ የለም፡ ያለ አጎበር ቢተኛም ምንም የሚረብሽ ነገር የለም 10. አጎበሩን ስንጠቀም ምንም የቢንቢ ድምፅ ወይም ንክሻ የለም 11. ልጄ ከአለፈው ጊዜ ጋር ሲወዳደር ሰውነቱን ትኩሳት አሞት አያውቅም/ቀንሶለታል 12. አንድስ እንኳ ትንኝ/ቢንቢ ቤት ውስጥ አይገባም 13. ከላይ ከተጠቀሱት ከአንድ በላይ ምክንያቶች 14. ሌላ ምክንያት(ቶች)ጥቀስ/ሽ----------	☐ ☐ ☐ ☐ ☐ ☐ ☐	
629	በስድስት ወር ጊዜ ውስጥ ስንት ጊዜ ነው አጎበሩን የሚያጥቡት? 1. ታጥቦ አያውቅም 2. ዳግም ለነከር ሲል አንዴ ብቻ 3. ሁለት ጊዜ 4. ከ3-5 ጊዜ 5. 6ጊዜ ወይም ከዚያ በላይ	☐ ☐ ☐ ☐ ☐ ☐ →	*631*
630	በምንድን ነው የምታጥቡት? 6. በዉሃና በሳሙና 7. በዉሃ ብቻ 8. በላምባ/በቤንዚን 9. በበረኪና 10. ሌላ (ጥቀስ/ሽ)----------	☐ ☐ ☐ ☐ ☐	
631	አጎበሩን ቶሎ ቶሎ ማጠብ የመከላከል ሀይሉን እንደሚቀንሰው ያውቃሉ? 3. አዎ አውቃለሁ 4. አላውቅም	☐ ☐	
632	አጎበራቸው በመድሀኒት ለመጀመሪያ ጊዜ/እንደገና ከተነከረና የጥያቄ 628 መልስ ደግሞ 2 ወይም 3 ወይመ ከሆነ፡ ለምንድን ነው አጎበሩን ቶሎ ቶሎ የሚያጥቡት? 5. አጎበሩ ቶሎ ቶሎ ስለሚቆሽሽ (በአቧራ በቡታ ጋዝ ጭስ) 6. በልጁ አይነ ምድርና ሽንት ስለሚቆሽሽ 7. ልጁ/ጆቹ ሲተኙ እንዳይመርዛቸው በመፍራት(ለመሳሌ በእንቅልፍ ልባቸው ያጎበሩን ጫፍ ሊያኩት ወይም ደግሞ ሊጎርሱት ስለሚችሉ) 8. ሌላ ምክንያት(ገለጥ)----------	☐ ☐ ☐ ☐	
633	ልጅዎ የሚጠቀምበት አጎበር ቀዳዳ አለው? 3. አዎ አለው 4. የለውም	☐ ☐	
634	መልስዎ ቀዳዳ አለው ከሆነ፡ ስንት ቀዳዳ?----------	☐	
635	ልጅዎን ከአጎበሩ ውስጥ ካስተኙት በኋላ አንዳንዴ ተንከባሎ ከአጎበሩ ውጭ ተኝቶ ያገኙታል? 3. አዎ አንዳንዴ አገኘዋለሁ 4. ከአጎበሩ ውጭ ሆኖ አግኝቸ አላውቅም		
636	ቤታችሁ ውስጥ አንድስ እንኳ የአልጋ አጎበር የሌለው ለምንድን ነው? 6. ወባን የአልጋ አጎበር በመጠቀም መከላከል እንደሚቻል አላውቅም	☐ ☐ ☐	

	7. የአልጋ አጎበር ወባን የመከላከል ሀይል የለውም 8. ወባን እንደሚከላከል ባውቅም ዋጋው ውድ ስለሆን ሊኖረን አልቻለም 9. መግዛት ብንፈልግም አቅርቦቱ በአካባቢው የለም 10. ሌላ ምክንት(ጥቀስ/ሽ)----------	☐ ☐ ☐	
637	በአሁኑ ሰዓት ያለው የአጎበር ዋጋ ውድ ነው ብለው ያምናሉ? 1. አዎ በጣም ውድ ነው 2. ውድ አይባልም 3. በጣም ርካሽ ነው		
638	ዋጋው ስንት ብር መሆን አለበት ብለው ያምናሉ?---------- ብር	☐	
639	የአልጋ አጎበር በነጻ መሰጠት አለበት ብለው ያምናሉ? 1. አዎ 2. መሰጠት የለበትም	☐	
640	የመድሀኒቱ ነክራስ በነፃ መደረግ አለበት ብለው ያምናሉ? 1. አዎ 2. መሰጠት አለበት ብየ አላምንም	☐	

አልጋ አጎበሩን በማየት የሚሞላ ቅጽ

1. ብዛት----------2. መጠን፡ ሀ. ትንሽ ለ. መካከለኛ ሐ. ትልቅ 3. ቅርጽ ሀ. አራት ማዕዘን ለ. ክብ

4 .ልጆች መኝታ ላይ የአጎበር መስቀያ አለው? ሀ. አዎ ለ. የለም 5. አጎበሩ በትክክል መኝታ ላይ ተሰቅሎ ይታያል ሀ. አዎ ተሰቅሎ ይታያል ለ. አልተሰቀለም 6. የቀዳዳ ብዛት፡------- 7. የአጎበሩ ንጽህና ፡ሀ. ደህና ለ. በጣም ቆሻሻ 8. የአጎበሩ አጠቃላይ ሁኔታ ሀ. በጣም ጥሩ ለ. ጥሩ ሐ. እጅግ በጣም ያረጀና የተጎሳቆለ መ. ተቆልፎበት /ያለጥቅም ተሰቅሎ የተቀመጠ ሠ. አርጅቶ የተጣለ ረ. ሌላ (ግለጽ)፡----------

ጊዜዎን ሰውተው ይህን መጠየቅ ለመመለስ ስለተባበሩን በጣም አመሰግናለሁ!!

Declaration

I, the under signed, declare that this is my original work and has never been presented in this or any other university and that all the source material used for the thesis have been duly acknowledged.

Name: ____ESHETU WASSIE (MD) _____

Signature: _____

Place: __ _ADDIS ABABA_____

Date of submission: _____July 14, 2005____

This thesis has been submitted with my approval as a university advisor:

Name: _AHMED ALI (PhD) _____

Signature_____

Date _____July 14, 2005_____

Annex 3: Interviewer & supervisor Training Manual (English Version)

ADDIS ABABA UNIVERSITY
DEPARTMENT OF COMMUNITY HEALTH

INTERVIEWER AND SUPERVISOR TRAINING MANUAL

THESIS RESEARCH TOPIC:

Assessment of Effectiveness of Insecticide Treated Nets for Malaria Prevention in under five Children of Aletawondo Woreda, Southern Ethiopia

Prepared by: Eshetu Wassie (MD)

Advisor: Ahmed Ali (PhD)

October 2004

I- Interviewer Training Information

Part One: General Information

Thesis Research Topic: Assessment of Effectiveness of Insecticide Treated Nets for Malaria Prevention in under five Children of Aletawondo Woreda, Southern Ethiopia

1. *The Purpose of the study*
   The purpose of this study is to assess the Effectiveness of Insecticide Treated Nets for Malaria Prevention in under- five Children of Aletawondo Woreda. Information that will be obtained from this research will be useful for planning effective and efficient implementation of ITN programmes in controlling malaria at household levels.
2. *How sample will be Selected*

A random sample of 148 net users and 148 non-owners matched with age category will constitute the sample.

3. *Scope and sponsor*
   This thesis will be undertaken as partial fulfillment of Masters Degree in Public Health (MPH). UNICEF-Ethiopia is sponsoring organization of this study. The total duration for data collection will be 09 days. A total of 10 interviewers and 04 supervisors are going to participate in this study. You are selected because it is believed that you will do the work as per set guideline given by this manual. It is hoped that you will be responsible on the task that you will be given. The data as single and the information in general from this study will contribute for individual, family, community and national level for promotion of health and prevention of diseases.

Therefore, you are kindly requested to give due attention for the following parts.

1. All information should be kept confidential.
   - Do not the write the name of the respondent (we are interested only in the information but not the name of the individual respondents) on the questionnaire.
   - Do not publicize or discus the names of individuals to others friends.
2. All the respondents must participate after they give their consent.
   - Do not force or reinforce an individual to participate in the survey. Only those who are interested and willing should be participated.
3. The participant who will be participating in this study should be respected and you should be polite during interview.
4. First, always make sure that whether the respondent have understood the questions or not. If necessary read the question repeatedly until the respondent understands it well. For questions you think are not well understood by the respondent after so many trials, you must ask her/him to tell you his understanding of the question by his own words and check for the consistency Otherwise, it may distort the whole meaning of the question and the response.
5. The respondent is expected to answer spontaneously for the understood questions and you are expected to follow the responses and tick the letter of choice that corresponds to the respondent's answers. If there are no spontaneous answers, read some of the choices especially for knowledge and practice questions.
6. Some of the choices may not be comprehensive to include all the answers of the respondent. So, you may have to write exactly what did they say. Never try to modify their responses after you let the person to go. However, you should check for some inconsistencies encountered during interview and control the situation.

Part Two: Approaching participants

I. *Identifying the right study child & respondent*

The list of households (name of heads and locations) and the number of nets purchased will be initially obtained from the roster of Woreda Health Office. Then, house numbering, enumerating ITNs at each household in the town, identification of eligible children and preparing the sampling frame will be done for three days prior to actual data collection. The house number given will represent the Identification Numbers (Codes) of the eligible children to easily trace-back them during actual data collection. Then, these children will be classified as net-owners and non-owners. When more than one under-five children who can fulfill the inclusion criteria is found in a household, one will be selected by lottery method. The sampling frame for each eligible cohort will be prepared. A random sample of 148 net-owners will be obtained and for each ITN owner drawn to be studied, a net non-owner child will be randomly selected from the sampling frame prepared during the census (total of 148 non-owners). The identification of house numbers of children to be included in the study (interview) will be done one day prior to actual data collection. The Amharic questionnaire will be interviewer administered for mothers or caregivers of children at home. If there is no mother or usual caregiver, a second visit to the household will be done. If still not found, any adult at the household will be interviewed. If there is no adult in the household, another sample will be drawn. For those used a net, the condition of their nets including hanging place, holes, etc will be observed during the interview using a checklist

prepared for this purpose. For those who reported to have experienced malaria in the study period and visited Chucko Health Center, their record at the health center will be reviewed to compare the self-reported outcome with the health workers' diagnosis (including laboratory) in both designs.

II. Getting into the households
- Greet the household members
- Ask for the head of the household member and then the mother
- Be polite and courteous during talking to respondents.

III. Activities after getting into the households.
- Introduce your name
- Explain the purpose of your visit
- Brief about the purpose of the survey
- Make sure that you have obtained informed verbal consent from the head & the mother.
- Consider only respondents above 15 years
- At times and meanwhile if the respondents are not willing to participate thank and leave the household
- Before you leave the household try to identify the reasons for non-response.

IV. Start the interview
- Identify the right person (preferably the mother or the other usual caretaker)from the household
- Choose comfortable, silent and appropriate place for interview.
- If you find two or more eligible children at household , select one by lottery method
- Read the questionnaire audible and if the respondent is hesitant to answer read it again
- Do not distort the questionnaire order
- Do not skip the questionnaire until it is stated in the skip column.

V. Completion of the interview
- Make sure that you have completed all the questionnaires
- Check for inconsistent answer & repeat that question and make correction based on the response
- If you have completed the questions tell her/him that you have finished
- Thank for the respondents spending their time.

Part Three- Interviewers Duties & interview process

- *Responsibilities of the interviewer*

Your main task and responsibilities as an interviewer are as follows:
- To prepare yourselves as interviewer and collect necessary supplies daily like: sufficient number of questionnaire, pen and pencil
- Start all activity as early as possible and identify, locate and remember the house.
- Read each question as loud and audible as possible
- List and document all response carefully and without judgment
- Record the response accurately according to the instruction given in the questionnaire
- Circle the response number from the given options and fill the space if it required.
- If the respondents are not willing , request her/him to come back but never force her/him
- If the house is locked or appropriate person is not around return the next day.
- During interview if additional information is necessary, use words like: - could you elaborate it more? Or could you be more specific?
- In case incomplete or inconsistent responses are found during daily checking of the questionnaires, you are responsible to go back to the household and re-fill it.

- Guide for interview

Always respondent’s first impression will be distorted or affected for their willingness at initial contact. Therefore, it is important to give due attention when you meet a respondent and follow the following rules:

- *Always remain neutral*. Your task as interviewer is to obtain an appropriate data. So that, as interviewer be friendly, firm but if necessary impressed. Your tone of voice, facial expression and even body posture will influence to establish the rapport from the respondents. So, don't show or express surprise, pleasure or disapproval at any time and do not give comment at any moment.
- *Answer the respondent's question directly*. Some respondents may ask you about the importance of the survey. Respond for the question as directly as possible. Be confident and be ready after reading this manual for giving direct response. If you are not sure about your response, always consult the immediate supervisor. But never give false promise for them.
- *Handle reluctant respondents' response cautiously*. Try to persuade by following guidelines:
    1. The information that they provide will be helpful for promoting health at individual, family and community level
    2. Assure that all information that will be obtained will be confidential. The respondents name will not be revealed for others.
    3. However, still the respondent has the right to discontinue the interview at any time.

Part Four: Practical Training

The practical training uses the following:

1. Reading practice
2. Self-reading exercise
3. Group discussion
4. Demonstration and re-demonstration
5. Field trial

1. Reading Practice

After introduction each interviewer will be given questionnaire and will do as follow;

- Read each page carefully
- Note any doubt, ambiguous phrase, words etc and take a note
- Keep them for discussion

1.2. Reading among the group

- Read the questionnaire loudly for the group
- The group respond to any difficulty during reading
- Note the difficulties and keep them for discussion

2. Demonstration and re-demonstration

2.1. Initially you are going to be demonstrated how to interview the respondent and practice by re-demonstration each others. During the interview each interviewer are expected to participate and re-demonstrate and follow the procedure strictly.

2.2. Note any difficulty during demonstration and forward during discussion.

3. Field trial
    - Each data collector will be given a sample of questionnaire for field trial
    - The interviewer will conduct the test and will be evaluated by the supervisor
    - If the interviewer will be supervised and any difficulties encountered there will be immediate correction and are going to be additional discussion.
    - Feel free to suggest any comments after discussion.

Part Five: Supervisor's guideline and duties

1. Maintain close contact with the team members to monitor and support the task done at each step during data collection.
2. Act as resource person for your team members thereby providing them with answers and clarification to questions that may not have been covered in their guidelines.
3. Organize and schedule activities of your team members in order to insure that the planned activities of the team are met within the required time frame.
4. Monitor the work in progress and report to the principal investigator.
    - Thoroughly review each completed questionnaire in order to ensure that the team members fill in all questionnaire comprehensively and correctly
    - Be available to be trained how to supervise & also assist in the training of team members

5. Checking and Editing

All questions should be reviewed from the beginning to the end for the following parts;

- Make sure that the interview result code has been recorded in the interviewer list of box on the cover page of the questionnaire
- Make sure that the interviewer has signed
- Make sure that all the instruction and place for skip have been respected.
- Make sure the responses are complete, legible and consistent
- Make sure that response code have been properly circled for each question
- If there are incomplete or inconsistent answers, identify the interviewer and ask him to refill it by going to the household.
- Collect all the correctly filled questionnaires and daily submit them to the principal investigator.

Annex 4: Amharic Version of Training Manual

አዲስ አበባ ዩኒቨርሲቲ
ሕክምና ፋኩልቲ
የህብረተሰብ ጤና ትምህርት ክፍል
ለሱፐርቫይዘሮችና መረጃ ሰብሳቢች ስልጠና የተዘጋጀ መምሪያ
የጥናቱ ርዕስ: *"Assessment of Effectiveness of Insecticide Treated Nets for Malaria Prevention in under five Children of Aletawondo Woreda, Southern Ethiopia"*
ተመራማሪ: እሸቱ ዋሴ (ዶ/ር)
የጥናቱ አማካሪ: ዶ/ር አህመድ አሊ

ጥቅምት 1997
አዲስ አበባ

ሠ. የመረጃ ሰብሳቢች ስልጠና መመሪያ

ክፍል 1: አጠቃላይ መረጃ

የጥናቱ ርዕስ: "Assessment of Effectiveness of Insecticide Treated Nets for Malaria Prevention in under five Children of Aletawondo Woreda, Southern Ethiopia"

4. የጥናቱ ዓላማ

መድሀኒት የተነከረ የአልጋ አጎበርን እድሜያቸው ከአምስት አመት በታች የሆነ ህጻናት ሲጠቀሙበት ወባን የመከላከል ሀይሉን ማጥናት ሲሆን ከዚህ ምርምር የሚገኘው መረጃም ቢያንስ በቤተሰብ ደረጃ ወባን ለመቆጣጠር የሚያስችሉ የአልጋ አጎበር ፕሮግራሞችን ለማቀድና ለማካሄድ ይረዳል::

5. የጥናቱ ናሙና: በአንድ የእድሜ ክልል የሚገኙ 148 አጎበር ያላቸውና 148 አጎበር የሌላቸው ቤተሰቦች ውስጥ የሚኖሩ ህጻናት ናቸው::

6. የምርምሩ ደረጃና ጥናቱን በገንዘብ ደጋፊ

ይህ ምርምር የሚካሄደው በህብረተሰብ ጤና ለማስትሬት ዲግሪ ማሟያ ነው:: ጥናቱን በገንዘብ የሚደግፈው በተባበሩት መንግስታት የህፃናት አድን ድርጅት በኢትዮጵያ ሲሆን መረጃውን ለመሰብሰብ የሚወስደው ጊዜ ዘጠኝ ቀን ነው:: አስር መረጃ ሰብሳቢችና ሶስት ሱፐርቫይዘሮች(ተቀዳሚ አጥኝውን ሳይጨምር) በምርምሩ የሚሳተፉ ሲሆን እርስ የተመረጡት በተዘጋጀው መምሪያ መሰረት አስፈላጊውን መረጃ ይሰበስባሉ ከሚል እምነት የተነሳ ነው:: ከዚህ ጥናት የሚገኘው ውጤት የግለሰቦችን÷ የቤተሰብን÷የማህበረሰብንና ብሎም የሀገርን የጤና ሁኔታ ለማሻሻል እገዛ ያደርጋል:: ስለዚህ ለሚከተሉት ነጥቦች ከፍተኛ የሆነ ትኩረት እንዲሰጡ በትህትና ይጠየቃሉ::

7. ተጠያቂች የሚሰጡት ሁሉም መረጃ በምስጢር መያዝ አለበት. የተጠያቂችንም ስም ቢሆን ለማንም መናገርም ይሁን ስላሉት ነገር ማውራት የለብወትም::

8. እያንዳንዱ ተጠያቂ መጠይቁን ሊሞላ/ሊጠየቅ የሚችለው ፈቃደኛ ሲሆን ብቻ ነው:: በምንም መልኩ አስገደዶ ወይም አባብሎ በጥናቱ እንዲሳተፍ ማድረግ የተከለከለ ነው::

9. ተጠያቂችን መብት ማክበር እንዲሁም ጥያቄውን በሚያካሂዱበት ወቅትም እጅግ በጣም ትሁት መሆን አለብት::

10. የእያንዳንዱን ጥያቄ መልስ ከመጻፍ በፊት ተጠያቂው ጥያቄውን በትክክል መረዳቱን ማሰተዋልና ካስፈለገም መደጋገም ይኖርብታል:: ደጋግመው ከጠየቁ በኋላ ተጠያቂው በደንብ ያልገባው መስሎ ከተሰማት ተጠያቂው ጥያቄውን በራሱ/ሷ ቋንቋ እንዲደግምል በትህትና መጠየቅና ከትክክለኛ ጥያቄው ጋር ማነጻጸርና ተገቢውን እርምት መውሰድ አለበት::

11. ተጠያቂው ጥያቄውን አዳመጦ ምርጫቹ ሳይነበቡለት መመለስ ሲኖርበት እርስ የሚባለውን ከምርጫቹ ጋር በማዛመድ መክበብ አለብት:: በተለይ የእውቀትና የድርጊት ጥያቄችን ተጠያቂው ምርጫው ሳይነበብ ካልመለሰ ብቻ ነው ምርጫቹን በማንበብ አስተያየቱ/ቷን መጠየቅ ያለብት::

12. **ለሁሉም ጥያቄች የተሰጡት ምርጫች ሙሉ በሙሉ የተጠያቂችን መልሶችና አስተያየቶች ላይመልሱ ይችላል:: ስለዚህ ምርጫ ውስጥ ሊካተቱ የማይችሉትን መልሶች ተጠያቂው እንዳለው መጻፍ ይኖርብታል:: ተጠያቂውን ካሰናበቱ በኋላ አባባላቸውን ለማስተካከል መሞከር ትልቅ ስህተት ነው:: ነገር ግን ሁለት የማይገናኙ መልሶችን ተጠያቂው ከሰጠ ይህ የሆነበትን ምክንያት ጠይቀው ማስተካከል ይኖርብ-ታል::**

ክፍል 2: የጥናቱን ተሳታፊች አቀራረብ

ሞህ. ትክክለኛውን ተሳታፊ ህፃንና ስለሱ መረጃ የሚሰጥ ሰው መለየት

መጀመሪያ ያልጋ አጎበር የወሰዱ የቤተሰብ ሐላፊችን ስምና አድራሻ ዝርዝር እንዲሁም የተሸጡ ያልጋ አጎበሮች ዋጋ ÷አይነትና ብዛት የሚያሳይ መረጃ ከወረዳ ጤና ጥበቃ ጽ/ቤት ወይም ከጤና ጣብያ ይሰበሰባል:: ቀጥሎ ለሁለት ቀናት የመንደሮችን ካርታ መስራትና ቁጥር መስጠት ÷በየቤቱ የሚገኙትን የአልጋ አጎበሮች ቁጥር አይነትና

ሁኔታ መለየት ÷ ለጥናቱ የሚስማሙትን ህጻናት መለየትና በዚሁም መሰረት ናሙና ለመውሰድ የሚያስችል ለጥናቱ ሊመረጡ የሚችሉ ህጻናት ያሏቸው የቤቶች ዝርዝር ዝግጅት ይካሄዳል፡፡ የተሰጠው የቤት ቁጥርና ያሉት የልጆች እድሜ የትኛው ቤት ውስጥ ያለ ልጅ መጠየቅ እንዳለበት በቀላሉ ለማወቅና በቀላሉም ቤቶቹ ድረስ ሄዶ መረጃ ለመሰብሰብ ይረዳል፡፡ ከዚህ በኋላ ህጻናቱ አልጋ አጎበር ተጠቃሚች(ያላቸው)ና የማይጠቀሙ(የሌላቸው) ተብለው ይለያሉ፡፡ በአንድ ቤት ውስጥ ለጥናቱ ብቁ የሆኑ ከአንድ በላይ ህጻናት ሲገኙ አንዱን በእጣ መምረጥ ይኖርብታል፡፡ ለእያንዳንዱ ክፍል ማለትም ለአጎበር ተጠቃሚችና ለማይጠቀሙ(ለሌላቸው) ህጻናት በእጣ ናሙና ለመውሰድ የሚያስችል ጠቅላላ ዝርዝር ይዘጋጃል፡፡ ከእያንዳንዱ ዝርዝር 148 አጎበር ተጠቃሚችና በአንድ የእድሜ ክልል የሚገኙ 148 አጎበር የማይጠቀሙ(የሌላቸው) ህጻናት በእጣ ይለያሉ፡፡ እጣውና የተመረጡት ልጆች ያሉባቸው ቤቶች የት እንደሚገኙ አንድ ቀን ቀደም ብሎ ይለያል፡፡ በአማርኛ የተዘጋጀው መጠይቅ ቢቻል ለህጻኑ እናት ካልተቻለ ለሁልጊዜ ተንከባካቢው ÷ከእነዚህ አንዱ የማይገኝ ከሆነ ግን ለሁለተኛ ጊዜ መምጣት ይኖርብታል፡፡ በሁለተኛው ከእነዚህ አንዱን ካላገኙ እድሜው ከአስራ ስምንት አመት በላይ የሆነ ስለህጻኑ በደንብ የሚያውቅ የቤተሰቡ አባል መጠየቅ ይችላል፡፡ ለአጎበር ተጠቃሚች የአጎበሩን መስቀያ ቦታ ÷ ቅርጽና መጠን ÷ አያያዝ ሁኔታ ለምሳሌ የቀዳዳ ብዛትና መጠን ወዘተ ለመመዝገብ መጠይቁን ከሞሉ በኋላ እንዲያዩና እንዲመዘግቡ በትህትና መጠየቅ አለበት፡፡ በአለፉት ሦስት ወራት ውስጥ ህጻኑ በወባ የታመመባቸውና ወደ ጨኮ ጤና ጣቢያ ወይም ደንጎራ ክሊኒክ ሄደው የታከሙትን ምልክት ማድረግ ሲኖርብ ይህንም ከየጤና ተቋማቱ መዝገብ ጋር ለማነጻጸር ይረዳል፡፡

ለ. ወደ ተጠያቂቹ ቤት ሲገቡ ÷ እጅግ በጣም ትህትና በተላበሰ መልኩ ÷

- የቤተሰቡን አባላት ሁሉ ሰላምታ መስጠትን አይርሱ
- የቤቱ ባለቤት(አባውራ/እማውራ) ከዚያም እናትያዋን ይጠይቁ
  - የቤቱን ሐላፊ ካገኙ በኋላ
- መጀመሪያ ስምን ያስተዋውቁና የመጡበትን አላማ ይግለጹቸው
- የጥናቱን አላማም ያስረዱ
- ቀጥሎ ስለልጃቸው በጥናቱ መሳተፍ አለመሳተፍ የቤተሰቡ ሀላፊንና የእናቱን ፈቃደኝነት ያረጋግጡ፡፡ ፈቃደኞች ከልሆኑ ያልሆኑበትን ምክንያት ጠየቀው አመስግነው ይውጡ፡፡
- እድሜው 18 ዓመትና ከዚያ በላይ የሆነው ሰው ከቤት ውስጥ መኖር አለመኖሩን ልብ ይበሉ፡፡ ምክንያቱም የቅርብ ተንከባካቢ ሊሆን ስለሚችል ነው፡፡
  - መጠይቁን ለመጀመር

- ተስማሚውን ተጠያቂ መምረጥ(ቢቻል የህጻኑን እናት ካልተቻለ የሁልጊዜ ተንከባካቢውን)
- መጠይቁን ለማድረግ ምቹና ጸጥታ ያለው ቦታ ይምረጡ
- እድሜው ከ6 ወርና ከዚያ በላይ ነገር ግን ከ5 ዓመት በታች የሆናቸው ልጆች በአንድ ቤት ውስጥ ካገኙ በእጣ አንዱን ይምረጡና ስለሱ ይጠይቁ
- ጥያቄችን ጮክ ብለዉ ደጋግመው ያንብቡ
- የተቀመጠውን የጥያቄ ቅደም ተከተል ይከተሉ
- መጠይቁ ላይ ካልተገለጸ በስተቀር ጥያቄ መዝለል በፍጹም የተከለከለ ነው
  - ጥያቄቹን ከጨረሱ በኋላ
- የሚመለከታቸውን ሁሉም ጥያቄች መጠየቃቸውን ያረጋግጡ
- የማይስማሙ መልሶች (ለምሳሌ ለሁለት ተመሳሳይ ጥያቄች ከላይና ከታች የመለሱት መልሶች ተቃራኒ አይነት ከሆኑ) ከተመለሱ እንደገና የመጀመሪያውን ተመሳሳይ ጥያቄ ይጠይቁና ያስተካክሉ፡፡
- ሁሉም በትክክል መሞላቱን ካረጋገጡ በኋላ መጨረስን ይንገሩና ተጠያቂውንና ቤተሰቡን አመስግነው ይሰናበቱ፡፡

ክፍል 3- የመረጃ ሰብሳቢች ሀላፊነትና የመጠይቁ ሂደት

- *የመረጃ ሰብሳቢች ሀላፊነት*

- እንደ ቃለ መጠይቅ አድራጊ ራስን ማዘጋጅትና ለዚሁም አስፈላጊ የሆኑ ነገሮችን ማለትም በቂ መጠይቅ ወረቀቶች ÷እርሳስ ÷ላጲስ ወዘተ.... በየቀኑ መሰብሰብ
- ጊዜን በአግባቡ ለመጠቀም ስራን በጠዋት መጀመርና ቤቶችንም በትክክል ማስታወስ
- ጥያቄችን በተገኘው አጋጣሚ ሁሉ ለራስ ማንበብ፡ እንዲሁም ቃለ መጠይቁን በሚጠይቁ ጊዜ ጭክና ረጋ ብለው ማንበብ
- የጥያቄችን መልሶች ተጠያቂቹ እንደመለሱት እንጅ እርስ በመሰለት አለመጻፍ፡፡ እዚህ ላይ የእርስ ታማኝንት በጣም ወሳኝ ነው፡፡
- የሚሰጡትን መልሶች በመመሪያቹ መሰረት በትክክልና በሚነበብ መልኩ መጻፍ፡ ለምሳሌ ምርጫቹን እንደ አስፈላጊነቱ መክበብ፡ምርጫቹ ውስጥ መልሱ ከሌለ ከተሰጠው ባዶ ቦታ መጻፍ
- ተጠያቂቹ ፈቃደኛ ካልሆኑ ሌላ ጊዜ እንዲመለስ እድል እንዲሰጥ መጠየቅ
- የተመረጠው ቤት ከተቆለፈበት ወይም እናት ወይም የህጻኑ የቅርብ ተንከባካቢ ከሌለ ከሰዓት ወይም በሚቀጥለው ቀን እንዲመለሱ ማድረግ
- በቃለ መጠይቁ ጊዜ ለየት ያለ መረጃ ያለ ከመሰለት፡የሚከተሉትን ሀረጎች ለማሳሌ « በደንብ ሊያብራሩት ይችላሉ? » ወይም« በግልጽ የትኛውን ለማለት እንደፈለጉ ሊነግሩኝ ይችላሉ? » ወዘተ....
- በተመራማሪው ወይንም በሱፐረቫይዘሮች የተሞሉ ወረቀቶች በየቀኑ ሲመረመሩ ምን አልባት በትክክል ያልተሞሉ ቢገኙ ቤቶቹ ድረስ ተመልሰው እንደገና የመሙላት ሀላፊነት አለብት፡፡

- ለቃለ መጠይቅ መሰረታዊ መርሆች
  - *ሁልጊዜም ወደ አንድ ወገን አለማድላት* :እንደ እንደ ጠቃሚ መረጃ ሰብሳቢነት ለተጠያቂቹ የቅርብ ጓደኛ ነገር ግን በአቋሙ ጽኑ ሰው መስለው ይታዩ፡፡ እንዳንዱዋ የድምጽወት ቅላጼ የፊትት ገጽታና የሰውነት እንቅስቃሴ ተጠያቂችን ሊያስደስት ወይም ሊያስቀይም ብሎም የሚፈለገውን መረጃም በትክክል እንዲያገኙ ወይም እንቅፋት ሊሆንብት ይችላልና ይጠንቀቁ፡፡ አላስፈላጊ የሆነ አስተያየት ከመስጠት ይቆጠቡ፡፡
  - *ለሚጠይቁ ጥያቄ ቀጥተኛና ታማኝ መልስ ይስጡ፡፡ ለመልሱ እርግጠኛ ካልሆኑ ሱፐርቫይዘርን ጠይቀው መልስ ይስጡ እንጅ በግምት ወይም የተሳሳተ መልስ አይስጡ፡፡ መረጃ ለማገኘት ብለውም ያልሆነ ተስፋ አይስጡ፡፡*
  - *አንዳንድ ተጠያቂች ግዴለሾች ሊሆኑ ይችላሉ ይህን አመለካከታቸውን እንዲያስ–ግዱና ትክክለኛውን መረጃ እንዲሰጡ ÷*
    1. የሚሰጡት መረጃ የህብረተሰቡንና ብሎም የሀገሪቱን ጤና ለማሻሻል በጣም ጠቃሚ መሆኑን ማስረዳት
    2. ማንነታቸው እንዲሁም የሚሰጡት መረጃ ምስጢሩ የተጠበቀ መሆኑን መንገር
    3. ነገር ግን ለመጠየቅም ሆነ ላለመጠየቅ መብታቸው መሆኑን መረዳት ያሻል፡፡

ክፍል 4፡ ልምምድ

ልምምዱ የሚካሄደው በሚከተለው መልኩ ነው፡፡

6. መጠይቆችን ደጋግሞ በማንበብ፡ ለራስ በማንበብና ለመመለስ መሞከር
7. የቡድን ንባብ
8. የቡድን ወይይት
9. ሰርቶ ማሳየት
10. በመስክ ስልጠና/ልምምድ

4. በማንበብ መለማመድ

እያንዳንዱ ሰልጣኝ አንዳንድ መጠይቅ ወረቀት ከያዘ በኋላ

- ቃል በቃል እያንዳንዱን ጥያቄ ያንብቡ

- ለመረዳት የሚያስችግሩ ወይም የተደጋገሙ የሚመስልት ወዘተ...ጥያቄ ወይም ምርጫ ካለ ማስታሻ ይያዙና ለውይይት ያቅርቡት፡፡

1.2. የቡድን ንባብ

- ጮክ ብለው ለቡዱን ጥያቄቹን ያንብቡ
- አስቸጋሪ የሚመስሉትን ጥያቀች ወይም ምርጫች ቡድኑ እንዲያይበትና እንዲመልስ ማድረግ አለብት

5. ሰርቶ ማሳየትና በራስ መድገም

2.1. በመጀመሪያ ተመራማሪው ቃለመጠይቁ እንዴት እንደማደረግ ካሰየ በኋላ እርስ ባዩት መሰረት ደግመው ማሳየት አለብት፡፡

2.2. ይህ ሲሆን የሚመለከቱትን ወይም የሚያጋጥምትን ችግር ለውይይት ማቅረብ አለብት፡፡

6. የመስክ ልምምድ

- እያንዳንዱ መረጃ ሰብሳቢ ለመከራ አንዳንድ መጠይቅ ወረቀት መስክ ሂዶ እንዲሞላ ይደረጋል
- የተሞላው መጠይቅም በሱፐርቫይዘሮች ይታያል፡፡
- በዚሁ ወቅት ችግር ካጋጠመ ማስታወሻ በመያዝ የችግሮችን ምንጭና መፍትሄ-ቹን ለውይይት ማቅረብ ይቻላል፡፡
- አስፈላጊ ሆኖ ካገኙት በውይይት ወቅት አስተያየት ከመስጠት አይቆጠቡ፡፡

ክፍል 5፡ የሱፐርቫይዘሮች ግዴታና መመሪያ

6. ሱፐርቫይዝ እንዲያደርጉ የተመደቡበትን ቡድን በቅርብ መከታተልና እርዳታ ሲያስፈልግም እርዳታ የማድረግ ከፍተኛ ሀላፊነት አለብት

7. ለሚጠየቁት ጥያቄች ሁሉ አስፈላጊውን መልስ የመስጠት ግዴታ አለብት

8. ስራቹ በጊዜአቸው ይሰሩ ዘንድ መቆጣጠርና ለዚህም ፕሮግራም ማውጣትና በቅርብ ማስተባበር ይኖርብታል፡፡

9. የቡድንትን የስራ ሂደት ለተመራማሪው በየቀኑ ሪፖረት ማድረግ ይጠበቅብታል

- የተሞላውን መጠይቅ አንድ በአንድ መመርምርና በትክክል መሞላቱን እንዲሁም መረጃ ሰብሳቢው በያንዳንዱ ላይ መፈረሙን ያረጋግጡ
- በትክክል ያልተሞሉ ካሉ ለሞላው ሰው በመስጠት እንደገና ተመልሶ (የጎደለው መረጃ) እንዲሞላ ያድርጉ

10. የመጠይቆች ምርመራና ማስተካከያ

ሁሉም ጥያቄች ጥናቱ ተጀምሮ እስኪያልቅ ድረስ በእያንዳንዱ ቀን ፡

1. ለመጠይቆቹ መልሶች የተሰጡት የመለያ ኮድ ሳጥኖች በትክክል መሞላቱን ማረጋገጥ
2. መረጃ ሰብሳቢው(ቃለ መጠይቅ አድራጊው) ስሙን መጻፉንና መፈረሙን ያረጋግጡ
3. ሁሉም መመሪያች በትክክል መተግበራቸውን ልብ ይበሉ
4. መልሶቹ ሙሉ መሆናቸውን የማይቃረኑና በትክክል የሚነበቡ መሆናቸውን
5. የመልሶቹ ምርጫች በማያሻማ መልኩ መከበባቸውን
6. ሙሉ ያልሆኑ ወይም ተቃራኒ መልሶች ቢኖሩ ለሞላው መረጃ ሰብሳቢ በወቅቱ ሰጥተው ቤቱ ድረስ በመሄድ እንደገና መሞላቱን አይርሱ
7. በትክክል ተሞልተው ያለቁትን መጠይቆች በመሰብሰብ ለተመራማሪው ማስረከብ አለብት፡፡

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