ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Effect of Concerns about HIV Testing in Delaying Early Presentation and Treatment of Malaria among Adults in East Shewa Zone of Oromia Regional State, Ethiopia

By

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DEDICATION

This thesis work is dedicated to my lovely parents Commander Tadesse Berhe and W/ro Abrehet Tareke; who have been the very sources of inspiration and strength throughout my academic life.

Especially, to my father whose sudden death recently was unbearable and unforgettable**.**

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LIST OF ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
ART	Anti Retro viral Treatment
BCC	Behavioral Change Communication
FGD	Focus Group Discussion
FMOH	Federal Ministry of Health
HCT	HIV Counseling and Testing
HEW	Health Extension Worker
HIV	Human Immunodeficiency Virus
IDI	Indepth Interview
IEC	Information Education and Communication
NGO	Non-Governmental Organization
OPD	Out Patient Department
PIHCT	Provider Initiated HIV Counseling and Testing
RDT	Rapid Diagnostic Test
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

ABSTRACT

Background: Early diagnosis and prompt treatment of malaria has been a key component of the global malaria control strategy. However, community members might be concerned that blood samples taken from finger-pricks for malaria diagnosis could also be used for HIV testing which has never been studied. Such concern and perception can cause delay in presentation for diagnosis and treatment which in turn can lead to the progress of severe and fatal malaria.

Objective: The objective of this study was to assess effect concerns about HIV testing in delaying early presentation and treatment for malaria among adults in East Shewa Zone of Oromia Regional State.

Methods: A facility-based comparative cross-sectional study design including both quantitative and qualitative data was used in five purposively selected health centres (Modjo, Meki, Batu, Bulbula and Shashemene) in the zone. Quantitative data were collected from October to November 2012 from HIV testing concerned (n=406) and unconcerned (n=404) suspected adult malaria patients (16 years or above). The sample size was allocated to the five health centres proportional to the number of patients tested for malaria at each facility during the preceding three months. Quantitative data collected using structured interview questions were supplemented with focus group discussions and in-depth interviews. Data entry, data cleaning and coding was performed using the Epi info version 3.5.1 Software, and exported to SPSS version 16 for analysis. Initial analysis was done by Chi-squared testing and subsequent analysis by binary logistic regression after adjustment for potential confounding variables. Associations between dependent and independent variables was assessed and presented using odds ratios and 95% confidence intervals. Qualitative data analysis was done based on the thematic approach and triangulated with the results of the quantitative result.

Results: Of 810 study participants, 56.4% (52.7% HIV testing concerned vs 47.3% unconcerned), were presented to the health centres after two days of the onset of illness. Regarding knowledge about malaria; 45.4% (45.6% HIV testing concerned vs 45.3% unconcerned) had low, followed by medium (32.6%), and good (22.0%) knowledge about malaria. Moreover 37.2% (41.2% HIV testing concerned vs 33.2% unconcerned) had low, 32.7% (31.1% HIV testing concerned vs 34.2% unconcerned) had good, and the rest had medium knowledge about HIV prevention and testing. The overall malaria positivity rate of this study

was 25.2% of which *P. vivax* accounts for 54.4%, *P. falciparum* 45.1% and mixed infection only accounts 0.5%.

Out of the total 406 respondents who were concerned majority (39.4%) were very sure, followed by somewhat sure (34.7%). regarding the degree to which they are sure that they would get an HIV test if they give their blood sample for malaria testing at health facility. Patients who were concerned are more likely to delay than those who were unconcerned [AOR=1.4; 95%CI (1.1, 1.9)]. Having ever sought advice or treatment from any source before coming to the health centre [AOR=4.9; 95%CI (2.4, 10.0)], having good knowledge about HIV prevention and testing [AOR=1.4; 95%CI (1.1, 1.9)], and having ever visited health facility in the prior twelve months [AOR=1.4; 95%CI (1.1, 1.9)] to their concurrent illness were also associated with delay in presentation to health centres for malaria diagnosis and treatment The main reasons cited for the delay in this study were mild illness, lack of time, being concerned about HIV testing, and lack of money.

Conclusion and Recommendation: Patients who were concerned about HIV testing from blood taken from finger-pricks for malaria diagnosis were more likely to delay than those who were not concerned. Accordingly health education on malaria and HIV testing should be provided in order to minimize the concern about HIV testing thereby improving the community's awareness and attitude towards early diagnosis and treatment for malaria.

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1. INTRODUCTION

1.1. Background

Malaria is a major public health problem. There were 216 million cases of malaria in 2010; 81% of these were in the World Health Organization (WHO) African Region. An estimated 3.3 billion people were at risk of malaria in 2010. An estimated 655,000 persons died of malaria in 2010. About 86% of the cases were children under 5 years of age, and 91% of malaria deaths occurred in the WHO African Region (1).

Malaria is preventable and treatable; there is no reason why anyone should die from the disease. Approximately 90% of the one million deaths caused by malaria each year occur in Africa, and about 20% of all deaths in African children less than five years of age are thought to be due to malaria (1). In sub-Saharan Africa, nearly 4% of all maternal deaths annually are the result of malaria-associated anemia. Overall, malaria constitutes 10% of the continent's disease burden (2).

Malaria infection in adults who live in a malaria endemic area, is not usually fatal because the patient has some acquired immunity, but fever and anemia resulting from malaria place an enormous economic burden on adults, and therefore on families, communities and countries. Pregnant women are also at great risk of severe malaria. Serious illness from malaria typically takes place during the late rainy season, which coincides with peak agricultural productivity and therefore leads to reduced agricultural output. Malaria is also responsible for high rates of school and work absentees, which have important short- and long-term social and economic impacts. Highly malarious countries are among the very poorest in the world, and typically have very low rates of economic growth(2).

Ethiopia is one of the malaria-epidemic prone countries in Africa. In 2003, more than 200 districts in the country were affected by malaria epidemics, resulting in over six million cases and an estimated 45,000 to 114,000 deaths (2). Of 15.3 million estimated annual malaria cases in the country, only 4-5 million cases are treated in health facilities (2). Malaria is prevalent in over 75% of the country’s landmass, putting 68% of the total population at risk. The disease accounts

for about 7% of outpatient visits and represents the largest single cause of morbidity. Large scale epidemics tend to occur every 5-8 years in certain areas due to climatic fluctuations and drought-related nutritional emergencies (3).

On the other hand, HIV voluntary counseling and testing (VCT) has been shown to have a role in both HIV prevention and, for people with HIV infection, as an entry point to care. It provides people with an opportunity to learn and accept their HIV sero-status in a confidential environment with counseling and referral for ongoing emotional support and medical care. People who have been tested sero-positive can benefit from earlier appropriate medical care and interventions to treat and/or prevent HIV-associated illnesses (4). Nevertheless, some people have negative attitude towards HIV testing. Moreover some people think that when they are pricked to test the blood for malaria, they think that they are being tested for HIV. They tend to believe health professionals can prove malaria by mere looking at signs like vomiting, shivering, and other basic signs (5). Thus this misperception can affect the treatment seeking behavior of patients for malaria.

1.2. Statement of the problem

One of the main components of the WHO's malaria control strategy is early diagnosis and prompt treatment with effective anti-malarial drugs. Early presentations, rapid diagnosis, prompt and adequate treatment are essential for preventing progress towards complications and can avert severe forms and most of the deaths due to malaria (6). However, a large proportion of malaria cases seek treatment from health care facilities after two days of the onset of illness due to various factors (7) indicating a delay in early presentation, diagnosis and treatment.

Currently, HIV/AIDS is the major global health problem, particularly in sub-Saharan African countries including Ethiopia (8). There is a stigma associated with HIV infection, as it has been perceived as an incurable disease and may be associated with discrimination, loss of income and associated infection in spouses/partners. Hence, despite the availability of treatments such as anti-retroviral therapies (ART), individuals may be reluctant to undergo testing of their HIV status as they do not wish to be exposed to the knowledge of a positive diagnosis and the social consequences (9).

Despite the requirement for an informed consent before requesting an HIV test on any blood sample, it appears that there may be a degree of concern in certain populations that having a blood test is synonymous with being tested for HIV infection. To our knowledge there have not been any study in this regard in Ethiopia and the only available data related to concern about HIV testing is from qualitative studies exploring the feasibility of introducing rapid diagnostic tests (RDTs) for malaria in Uganda in a variety of settings (5, 10). In one study, community members expressed concern that blood samples collected for malaria could be used for HIV testing rather than malaria (5). Similarly, in the second study, there were concerns that in most communities people think that giving blood sample for malaria is presumed to be` testing for HIV and some do not want their HIV status disclosed (10).

Concerns about the belief that the blood drawn during malaria diagnosis by microscopic examination or RDT can also be used for HIV testing has been hypothesized as one of the main barriers against the early presentation for diagnosis of malaria patients at the health facilities. This delay in presentation for investigation can lead to the progress of severe and fatal malaria (11).

As malaria can be diagnosed using laboratory assays and effective treatments exist, the key step to ensure prompt treatment is early presentation to a health care facility for investigation and diagnosis. Hence, any barrier that impedes early presentation at health care facilities should be identified for amenable intervention. However, studies that examined concerns about HIV testing in delaying early presentation of adult malaria patients to the health facilities are highly limited. If our hypothesis is true, this is important as it is a perception that is open to modification by appropriate interventions, hence improving the early delivery of appropriate anti-malaria treatments to patients. Therefore, this study is aimed to bridge this gap by assessing the concerns about HIV testing in early diagnosis and treatment of malaria among adults in East Shewa Zone of Oromia Regional State in Ethiopia.

2. LITRATURE REVIEW

2.1 Global situation of malaria

Malaria is the world's most widespread infection. According to the World Malaria Report 2011, malaria is prevalent in 106 countries of the tropical and semi-tropical world, with 35 countries in central Africa bearing the highest burden of cases and deaths (12). Moreover, there were 219 million cases and 655 000 malaria deaths worldwide in 2010, compared to 7,81,000 in 2009 (12, 13). It has been estimated that 91% of deaths in 2010 were in the African Region, followed by the South-East Asia (6%) and Eastern Mediterranean Regions (3%); and about 86% of deaths globally were in children under 5 years of age (12) Of the 35 countries that accounted globally for about 98% of malaria deaths, 30 were located in sub-Saharan Africa (13). Of 99 countries and areas with ongoing malaria transmission in 2011, 50 countries, including 9 in the African Region, are on track to meet World Health Assembly (WHA) and Roll Back Malaria (RBM) targets: to reduce malaria case incidence by 75% by 2015. Of these 50 countries, 44 had already attained a 75% reduction in case incidence by 2011 (14).

Globally 3.3 billion people are at risk of malaria and nearly one million malaria deaths occur each year, malaria is the second leading cause of morbidity and mortality in Africa. Many of these deaths occur at home due to poor access to health care, inappropriate or delayed care seeking and inadequate quality of health services (5). Malaria remains the major cause of morbidity and mortality particularly in sub-Saharan Africa. In areas with low endemicity, malaria is characterized by frequent and often large-scale epidemics associated with high case fatality rates (15).

2.2 Malaria situation in Ethiopia

Malaria is a major public health problem in Ethiopia despite a relatively low malaria prevalence compared to most other malaria-endemic countries in Africa. Unstable malaria transmission patterns make Ethiopia prone to focal and multifocal epidemics that have on occasion caused catastrophic public health emergencies. Malaria is seasonal in most parts of Ethiopia, with variable transmission and prevalence patterns affected by the large diversity in altitude, rainfall, and population movement (16). Overall, according to the Federal Ministry of Health (FMOH), in

2009/2010 malaria accounted for up to 12% of outpatient consultations and 10% of health facility admissions. Ethiopia is at a high risk of epidemics of malaria due to climate and topography. In order to improve the quality and timeliness of epidemic detection and aid in monitoring trends in malaria epidemic detection sites have been established with President's Malaria Initiative Funding in the Oromia Region (17).

Malaria prevalence is highest among the poorest people of the society, since they cannot afford protection from malaria through improved housing, clean environment and are particularly vulnerable to the impact of ineffective diagnosis and treatment. *Plasmodium falciparum* and *Plasmodium vivax* are the two predominant malaria parasites in Ethiopia; *P. falciparum* accounts for 60-70% of infections, while *P. vivax* accounts for the remaining 30-40% (18). The FMOH estimates that there are 5 – 10 million clinical malaria cases each year. However, of these, only one million are reported at the national level, with 462,623 (55.84%) examined and 256,487 (23.68%) confirmed positive by a diagnostic test in 2009/2010. The completeness of this report, though, is questionable. According to FMOH reports, approximately 70,000 people die of malaria each year in Ethiopia (19). According to MIS2011 which is a community based survey, *P. falciparum* constitutes the larger proportion of cases detected by microscopy (77%) in areas <2,000m. In Oromia, however, *P. vivax* was the main etiologic agent of cases confirmed by microscopy, with 60% of slide-positive cases (16).

A study conducted in East Shewa indicated that both *P. falciparum* and *P. vivax* were responsible for the causes of 52.6% and 47.4% of overall malaria illnesses among the study subjects, respectively (7). Another study carried out in Jimma revealed that malaria parasite prevalence was 5.2% of which *P. vivax* accounts for 71.4%, *P. falciparum* 26.2% and mixed infection only accounts 2.4% (20).

The specific strategies that Ethiopia is employing to reach the goals of the 2010-2015 National Strategic Plan for Malaria Prevention, Control and Elimination in Ethiopia are: community empowerment and mobilization through the health extension worker program and a recently introduced "Health Development Army," diagnosis and case management, surveillance, health systems strengthening, and capacity building.

2.3 Factors associated with delay in presentation and treatment of malaria patients

Based on 14 health behavior models, derived six factors relevant for understanding health behavior (21). Three of them are cognitive factors which are useful for the study of delay in seeking prompt and adequate care (22). These are attitudes to health care, perception of the disease threat, and knowledge about disease. Several studies have been done on treatment-seeking behaviors in the past. It is recognized that treatment of malaria usually starts at home and households seek care outside if home treatment was not successful, resulting in delays of seeking treatment from a proper care provider (23-25).

Early diagnosis and prompt treatment has been a cornerstone of malaria control. Ensuring prompt and effective treatment will prevent most cases of uncomplicated malaria from progressing to severe and fatal illness (18). To avoid this progression, treatment must begin as soon as possible, generally within 24 hours after symptom onset. In the Abuja declaration of 2000, African heads of state committed themselves to ensure that 60% of childhood fevers are treated with effective anti-malarial medicines within 24 hours of symptom onset, a target that has since been increased to 80% by 2010 (26). According to the goals of the 2010-2015 national strategic plan for malaria prevention, control and elimination in Ethiopia 100% of people living in malarious areas will seek treatment within 24 hours of fever onset (18).

In countries where malaria is endemic, delay or failure in seeking treatment of common symptoms such as fever or headache from providers of effective case management may have fatal consequences, particularly in young children. Although there is convincing evidence that use of ineffective anti-malarial drug therapy may be responsible for increasing mortality trends in sub-Saharan Africa, arguably an equally important contributor to the problem is the observed practice of self-medication and increased reliance on informal sources of care (27).

A study done in East Shewa (7) indicates that only 25.5% of the patients visited the laboratories within two days while the remaining 74.5% came to malaria control laboratories three or more days after the onset of malaria illness. The main reasons cited for the delay (three or more days) were mild illness (44.2%), high workload (19.9%), financial problems (19.2%), and thought of other diseases (12.3%).

Another study carried out in Butajira district indicated that 65% of the people with febrile illness most probably due to malaria visited health facilities after three or more days following the onset of illness (28). In a study conducted in Sri Lanka, about 67% of patients began to seek treatment after two days of the onset of malaria (29). A study conducted in Adami Tulu shows family or self-diagnosis was the most common type of diagnosis within the first 24 hours of the onset of illness. Clinical diagnosis by health workers including community health workers and laboratory diagnosis was infrequently mentioned within the 24 hours of illness onset. The vast majority (76%) did not get any type of treatment or intervention within the first 24 hours of the onset of illness while 47% waited for three or more days without seeking treatment (30).

Another study conducted in Sudan indicates that majority sought advice from health personnel, a few reported self-medication and very few consulted traditional healers. The majority (73.0%) sought advice more than 24 hours after the onset of the fever. Non-attendance at hospitals included distance, lack of money, lack of transport and all of these (31).

The study done in India (32) indicates about 66.5% patients waited for more than three days before consulting a doctor. About 30% patients did not go to the doctor on the same day of onset of fever, since they had no time, 25.5% patients tried self-medication, out of which nearly half said that they had taken antibiotic and antipyretic for fever (32). The fact that majority of patients went after three days or more of fever for treatment and also that they preferred self-medication or chemists as the first line of management suggests that fever is not perceived as a serious symptom (33).

A qualitative study conducted in Uganda indicates that there was fear that RDTs used at drug shops could be used to test for HIV when people have not consented to know their status. In most communities people think that taking of blood means testing for HIV especially in those who don't want their HIV status disclosed. Because of this, some people shy away from the drug shops (10).

2.3.1 Knowledge and perception about malaria

Knowledge is a crucial element in health improvement and the education of a disease-burdened group on the ways of disease prevention is important to the attainment of self-reliance in disease endemic countries (34). Community perceptions relating to causation, transmission, prevention

and treatment are the main socio-cultural factors that can influence malaria control (35). The success of malaria control programmes at present relies heavily on community perceptions and practices in the transmission, treatment and control of the disease. Incorrect beliefs or inappropriate behaviour can interfere with the effectiveness of a control measure, such as vector control or chemotherapy (36).

A study conducted in Tigray indicates shivering was the most frequently reported malaria symptom, followed by body pains and fever. Most of the respondents (92.7%) were able to mention at least one symptom of malaria and 65.3% could mention three symptoms or more. Mosquito bite as a mode of transmission for malaria was recognized by nearly half of the respondents. Almost all the respondents believed that malaria can be cured and pointed modern medicine as the adequate treatment. Most of the respondents, 65.9%, believed that malaria can cause death while 23.4% did not. Though the majority of participants believed that malaria is a preventable disease, few considered the opposite (37).

A study conducted in India indicates majority of patients, 99 (49.5%) enumerated two symptoms of malaria (fever/chills) followed by 61 (30.5%) patients who could enumerate three symptoms (32). Many studies have shown (38-40) that respondents have an idea about 2–3 symptoms of malaria. In another study (41), 13% respondents quoted that eating raw vegetables and drinking dirty water were probable causes of malaria and 45% respondents did not answer correctly about causes of malaria whereas in study done in India 38.5% respondents could not answer correctly. Other studies (33, 39) have associated malaria with witchcraft, bedbugs and swimming.

A study conducted in Indonesia indicated 738 (74%) respondents believed that malaria illness is dangerous and often fatal; and 96% of the respondents believed that without medicine, people with malaria remain chronically ill or eventually die (42). A survey done in Uganda (43) noted a strong perception among community members (75%) that children under five were more vulnerable to malaria than older children or adults; and only 10% of the respondents felt that pregnant women were also more vulnerable to malaria. In another related survey conducted in Uganda, it was noted that 82.5% of the respondents perceived that pregnant women were more vulnerable to malaria, while 97% thought that children below five years were more vulnerable to malaria (44).

2.3.2 Knowledge and perceptions about HIV Testing

HIV counseling and testing (HCT) is an important part of a continuum of HIV prevention and treatment services. It is one of the main times when a comprehensive individual risk assessment is taken, making it the best opportunity for accurate referrals to more intensive services. HCT is also one of the primary entry points into prevention and other services (45). It has three distinct components: risk assessment and counseling before the blood sample is taken, testing of the sample, and counseling and referral with the test results (46).

HCT can be confidential; person's name is recorded with the test results or anonymous; no name is recorded with the test. Publicly funded HCT takes place in testing centers, community health clinics, community-based organizations, outreach programs, mobile vans, sexually transmitted diseases and family planning clinics and local health departments (47). But due to the under utilization of the client initiated HIV counseling and testing the revised UNAIDS / WHO policy statement on HIV testing recommended that provider initiated HIV counseling and testing (PIHCT) should be implemented in clinical settings. This approach differs from VCT in that HIV testing is requested by the health care worker and is an integral part of the clinical interaction. There is greater emphasis on 'opting out' (patients undergo an HIV test as part of the diagnostic work-up unless they specifically decline), and there is a higher priority on post-test rather than pre-test counseling, particularly if the patient is HIV-positive (48, 49).

Stigma is of utmost concern because it is both the cause and effect of secrecy and denial, which are both catalysts for HIV transmission. Fear of stigma limits the efficacy of HIV-testing programs across sub-Saharan Africa, because in most villages everyone knows sooner or later who visits test sites (50, 51).

A study conducted in Bahirdar indicates around majority of the respondents know about whether one can check his/her HIV status or not, as well as majority indicated that they know where to get the VCT service. Knowing HIV status, avoiding risky behavior, and taking a better care for self and partner are the most frequent reasons forwarded by the respondents about the importance of using VCT service. Another study done in Gondar (North West Ethiopia) indicates that among the total responding study subjects, majority were aware that one could check his/her HIV status.

Regarding the availability of VCT services, majority knew about the availability of the services. The main sites mentioned by the respondents to get the VCT services were: hospitals (69.3%) and polyclinic (7.5%) (52, 53).

According to the finding of the latest Ethiopia Demographic and Health Survey (EDHS) (54), the majority of Ethiopian adults (63% of women and 78% of men) know that a healthy-looking person can have HIV. The most common misconception about HIV transmission is that it can be transmitted by mosquitoes in more than half (52%) of women and 37% of men. About 73% of women and 86% men reported that people can reduce their chance of getting HIV by abstaining from sexual intercourse. Moreover, 66 % of women and 82 % of men know where to get an HIV test. The level of this knowledge is substantially higher among urban residents (91% of women and 97% of men) than among rural residents (59% of women and 78% of men). Furthermore, 20% of women and 21% of men were tested for HIV in the year preceding the survey and received the results.

A study done in China shows that VCT-related knowledge was closely related to education level. The most important barrier for HIV testing was belief of no risky behaviors (62.4%). Other barriers included: afraid of being seen by friends, people might think that they have AIDS, afraid that health personnel would not keep the test result confidential, and fear of discrimination if positive (55). Another study carried out in Botswana indicates 118 participants agreed that testing for HIV is important, while only five participants strongly disagreed to that (56). Another study conducted in Nigeria had comparable results when they found that 93.6% of their respondents felt that testing for HIV is important (57).

The above literature can be explained by the following conceptual frame work (Fig. 1). Factors such as socio-demographic characteristics, knowledge and perception of malaria, and knowledge and attitude about HIV testing can lead to delayed presentation for malaria diagnosis and treatment either directly or indirectly thereby making concerned about HIV testing, and using home management. This conceptual framework which is developed by the principal investigator is important for the understanding of the determinants of delay in presentation for malaria diagnosis and treatment at health facility.

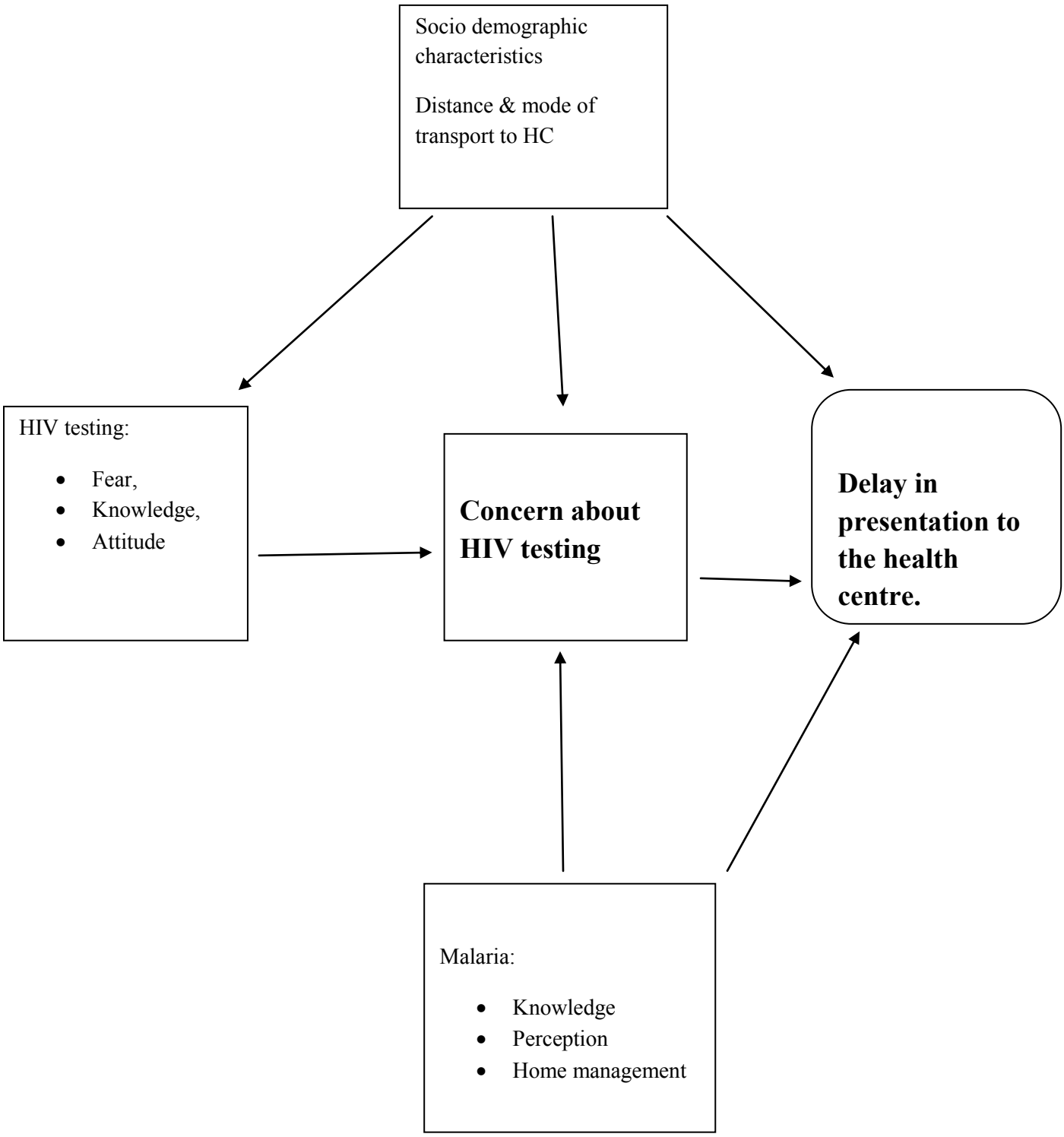

Fig. 1 Conceptual Framework for predictors of delay in presentation and treatment for malaria.

Research Hypothesis

H_O: There is no difference between the proportion of patients concerned about HIV testing who have had symptoms for more than two days and the proportion of patients unconcerned about HIV testing who have had symptoms for more than two days.

H_A: The proportion of patients concerned about HIV testing who have had symptoms for more than two days is higher than the proportion of patients unconcerned about HIV testing who have had symptoms for more than two days.

3. OBJECTIVES

3.1. General objective

To assess the effect of concerns about HIV testing in delaying early presentation and treatment of malaria among adults in five woredas of East shewa zone of Oromia Regional State.

3.2. Specific objectives

1. To identify knowledge and perceptions of patients about malaria and HIV testing
2. To determine the prevalence of malaria among individuals who present with symptoms consistent with a diagnosis of malaria and give blood for microscopic examination
3. To determine if the duration of malaria symptoms is longer among individuals concerned about HIV testing compared to those unconcerned.
4. To determine factors associated with delay in presentation for malaria diagnosis among adults

4. SUBJECTS AND METHODS

4.1. Study area and period

This study was conducted in five health centers located in East Shewa Zone of Oromia Regional State in Ethiopia. The study was carried out from October 2012 to December 2012. East Shewa Zone is located in the middle of Oromia in southeast Ethiopia, connecting the western regions to the eastern ones. Based on the 2007 national census, this Zone had a total population of 1,356,342, of whom 696,350 were men and 659,992 women (Central Statistical Agency of Ethiopia). The main ethnic group residing in the zone is Oromo. The zone has 3 hospitals, 18 health centres and 296 health posts. Currently the number of government health centres is two in Batu, two in Meki, two in Mojo and one in Bulbula. As well as there is one hospital and three health centre in Shashemene woreda (58).

The five study health centres were Mojo, Meki, Batu, Bulbula, and Shashemene. Although Shashemene had been administratively located in East Shewa Zone for many years, according to the new administrative restructuring of the Oromia region, it has been demarcated to the newly established West Arsi Zone in 2004. Thus the study area was located in two zones. East Shewa was selected for this study because of the following reasons; it is the most malarious area in the region, and it is a transition zone to many parts of southern Ethiopia, many rural and urban migrants are attracted for trading possibilities and seasonal employment and it is the most ethnically mixed town in Ethiopia. Malaria is the third leading causes of OPD visit (36%) in East Shewa Zone. Currently in the health centers, malaria diagnosis is being done by microscopy of a blood sample taken from finger prick, whereas multi-species RDTs capable of specifically detecting both *P. falciparum* and *P. vivax*, are being used at health posts. In addition to this HCT is being done by both modalities; VCT and PIHCT in all the health centres of the zone.

4.2 Study design

A health facility-based comparative cross-sectional study design mainly with quantitative research approach, supplemented by qualitative methods, was employed for this study. Interviewer administered questionnaire was administered for adults selected for this study, while focus group discussions (FGDs) and in-depth interviews (IDIs) was used for the qualitative study.

4.3 Source population

All adult patients with malaria symptoms in the study woredas' constitute the source population for the study. Malaria focal persons in the study areas were also constitute secondary source population.

4.4. Study population

The study population consisted of all self-reported adults with malaria symptoms attending the selected health centres and give blood for microscopic examination.

4.5. Sample population

All self-reported patients with malaria symptoms who give blood for microscopic blood film examination and included in the study based on the inclusion criteria was the sample population.

4.6. Sample size determination

4.6.1. Sample size for the quantitative study

In the month of September 2011, 130 microscopically confirmed malaria cases were identified at Batu health centre, which represents approximately 30% of those who were tested. As the malarial season lasts from September to December, this represents approximately 520 cases of malaria in total and 1700 suspected cases of malaria. Assuming that 50% of these are individuals above the age of 15 years, we would have 850 individuals aged above 15 years from this single centre. Assuming a recruitment rate of approximately 20% we would need five comparable centres each providing 170 adult respondents that would give us a total of 850 individuals.

The main outcome measure of interest in this study is the duration of malaria symptoms prior to presentation at the health centre in those who were concerned about HIV testing compared to those unconcerned. Assuming that 50% of individuals were concerned about HIV testing and 50% have had symptoms for three days or more, we would have over 80% power to detect an absolute difference of 15% in those were concerned about HIV testing compared to those were unconcerned about HIV testing.

The sample size associated with the key outcome indicator, duration of malaria symptoms prior to presentation at the health centre, was used. Using the percentage of individuals with duration

of malaria symptoms prior to presentation at the health facility among those who were concerned about HIV testing and 15% absolute difference with those who were unconcerned about HIV testing in individuals, the total sample size required for the study was estimated based on the following assumptions:

- **50%** of adults with malaria symptoms who were concerned about HIV testing have had symptoms for more than two days (P1)
- **35%** of adults with malaria symptoms who were unconcerned about HIV testing have had symptoms for more than two days (P2)
- Type I error (α) probability of 5% (two-tailed test), 95% confidence level ($z_{\alpha/2}$)
- Power of 80% (β=0.84) to detect at least a 15% difference between the two groups ($z_{1-\beta}$)
- Design effect for cluster surveys, *DEFF* of 2, is used as a multiplier to increase the sample size to account for the effect of the cluster sampling method related to the selection of health centres instead of simple random sampling.

Sample size was determined using two-population proportion formula.

$$n_1 = \frac{\left[z_{\alpha/2}\sqrt{(r+1)\bar{p}\bar{q}} + z_{1-\beta}\sqrt{rp_1q_1 + p_2q_2} \right]^2}{r(p_1 - p_2)^2}, \quad n_2 = r \times n_1$$

Where:

- n_1= number of adults with malaria symptoms who were concerned about HIV testing.
- n_2= number adults with malaria symptoms who were unconcerned about HIV testing.
- r= the ratio of n_1 to n_2 =1

From the formula n_1= n_2=182. By considering design effect of 2 and 15% non-response rate the final sample size (N) was calculated to be 838. That is the total sample size required for each group was 419 individuals above the age of 15 years.

4.6.2. Sample size for the qualitative study

The quantitative study was complemented using FGDs and IDIs. The purpose of the qualitative study was to collect information to better understand the concerns of HIV testing among malaria patients attending health centres help to fill the gaps inadequately addressed by the quantitative study. A total of four FGDs; two from health centers (Meki and Batu) with adults with malaria symptoms and two from community (Mojo and Shashemene) with healthy adults were conducted. The number of participants in each FGD was 6-8 people. In-depth interview was conducted with malaria focal persons at each of the health centre.

4.7. Sampling procedures

There are a total of 18 health centres in East Shewa Zone. Of these, five health centres (Mojo, Meki, Batu, Bulbula and Shashemene) were purposively selected considering the high number of malaria patients attending the health facilities. The total sample size was proportionally allocated to each health centre considering the total number of suspected malaria patients tested during the previous three months **(**June-August, 2012**)** prior to the beginning of the study. All patients with malaria symptoms referred from the OPD to the laboratory facility for blood testing for malaria was invited to participate in this study. Since the number of patients attending the health centre for malaria testing was not large enough, we included all patients attending the laboratory for microscopic examination for malaria.

A screening question was used to identify those who were concerned and unconcerned. Hence, the selection of study subjects was based on consecutive sampling until the sample size allocated for the health center was completed. Participants of the qualitative study were selected purposively to get in-depth information about concerns of HIV testing among malaria patients presenting to the health centers and from the community.

4.8. Inclusion and exclusion criteria

Inclusion criteria: All adult patients (aged 16 years or above) who were clinically diagnosed for malaria and requested for malaria blood film testing at the laboratory of each health center during the time of the study.

Exclusion criteria: Patients who were deaf, mentally retarded, critically ill, or unwilling were excluded from the study.

4.9. Data collection

4.9.1 Quantitative data collection

A structured questionnaire was initially developed in English and then translated into local language (Afan Oromo) for data collection. The questionnaire yet gathered data on the following areas: 1) Socio-demographic characteristics; 2) Knowledge and perception about malaria; 3) Knowledge about HIV/AIDS prevention and testing; 4) Concerns about HIV testing in delaying early presentation and treatment for malaria; 5) Treatment seeking behavior for malaria; and 6) Laboratory results. The questionnaire was back translated into English by another person to ensure its consistency. Nine days before the data collection, the questionnaire was pre-tested on 20 questionnaires for each study group in Arsi-Negele health centre that is not selected for the study to ensure its suitability for the study. Based on the findings of the pre-testing, appropriate amendments and revisions were made before the final administration of the questionnaire for actual data collection.

Currently malaria diagnosis is being done using microscope in laboratory in all the health centres of the zone. There are two methods of microscopic diagnosis of malaria namely thick blood film and thin blood film. Light microscopy of a dried smear of thick blood films with Giemsa stain is used to detect the malaria parasite. Whereas light microscopy of thin blood film stained with Giemsa is used for identifying the species of the malaria parasite. Multi-species RDTs capable of specifically detecting both *P. falciparum* and *P. vivax* is being used in the health posts (59).

One laboratory technician (data collector) and one supervisor from each health centre were trained for two days on the data collection instrument, interview techniques and recruitment of the study subjects. The interview took place after blood is drawn from patients with malaria symptoms. The trained laboratory technician in the laboratory sites administered the questionnaire after obtaining an informed consent from an individual with malaria symptoms. Data were also collected on the results of the subsequent malaria blood film results to permit stratification by positive and negative blood film status. The data collectors and supervisors were fluent in writing, reading, and speaking the main local language. The supervisors reviewed the questionnaires on daily basis in the field to ensure completeness and consistency. A final review

of the completed questionnaires was conducted at the health center by the principal investigator (Annex 2).

4.9.2. Qualitative data collection

Four FGDs were conducted with groups of 6-8 persons. The moderator (i.e., principal investigator) and note taker conducted the qualitative data collection. IDIs were also conducted by the principal investigator. Both FGDs and IDIs were carried out using a discussion and in-depth guides, respectively. With the consent of the participants, focus group and in-depth interviews were audio taped. Socio-demographic characteristics of the qualitative participants such as age, occupation, religion, marital status and education were also documented (Annex 2).

4.10. Data quality control

The quantitative questionnaire and qualitative guides was pre-tested in a purposively selected health centre (Arsi-Negele) that has not been selected for the study. There were discussions on any kind of problem the data collectors faced during the data collection process. Data was checked for completeness, consistency and soundness by the supervisor and principal investigator. The collected data were manually checked and coded for completeness before data entry. Moreover data cleaning was performed during and after data entry.

4.11. Data processing and analysis

Data entry, data cleaning and coding was performed using the Epi info version 3.5.1 Software. Development of data entry templates, data cleaning, processing, analysis and the overall management of the data was done by the principal investigator. Codebook, analysis and tabulation plans were developed in advance. The data were exported to SPSS version 16 for analysis. To describe the study population in relation to relevant variables, frequencies and summary statistics were used. Knowledge score was done by combining related variables together and divided in to low, medium, and high using percentile in order to assess the association with the dependent variables. Initial analysis was done by Chi-squared testing and subsequent analysis by binary logistic regression after adjustment for potential confounding variables such as sex. Associations between dependent and independent variables was assessed and presented using odds ratios and 95% confidence intervals.

Qualitative data was transcribed and translated at the end of each discussion. Qualitative data analysis was done based on the thematic approach that involves organizing concepts from the collected information into meaningful category. A coding dictionary was developed as part of the data analysis. The data analyses included triangulation of data across groups (FGDs and IDIs) and compliment/explain the quantitative results. Each finding of the qualitative data is merged with its respective part of the result of quantitative data.

4.12. Variables

4.12.1. Dependent variable

- Delay in presentation

4.12.2. Independent variables

- Socio-demographic characteristics: sex, age, educational status, religion, ethnicity, marital status and occupation
- Distance travelled and mode of transport to the health centre.
- Individual's assessment of the likely diagnosis
- Home management prior to coming to the health centre
- Microscopic diagnosis (positive or negative) and the types of species for positives
- Concerns about blood sample being tested for malaria as well as HIV
- Knowledge about HIV testing
- Attitude towards HIV testing
- Fear of HIV testing
- Perceived severity of malaria
- Perception on malaria testing

4.13. Operational definitions

Malaria tests – are kind of blood tests used to determine the presence of Plasmodium parasite in blood. These are blood microscopy and RDT.

Malaria: Identification of Plasmodium species infection confirmed through microscopic examination of blood films prepared from suspected malaria patients.

HIV tests – are an antibody test used to determine whether a person is infected with HIV or not by checking the antibodies against the virus in the blood.

Concern about HIV testing –

> **Concerned:** Those suspected malaria patients who think that the health professionals will check their HIV status from the blood sample collected for malaria diagnosis, without their consent.
>
> **Unconcerned:** Those suspected malaria patients who do not think that the health professionals will check their HIV status from the blood sample collected for malaria diagnosis, without their consent.

Delay in presentation – Presentation of the patient to the health facility after two days of the onset of malaria symptoms (7).

Knowledge about malaria (Thirteen questions related to malaria are combined together and finally the resulting score is divided in to three by using percentiles):

> **Poor:** Malaria knowledge score of ≤31
>
> **Medium:** Malaria knowledge score of 32-33
>
> **Good:** Malaria knowledge score of 34-43

Knowledge about HIV prevention and test (Combination of six questions related to HIV prevention and test):

> **Poor:** HIV prevention and test knowledge score of ≤ 7
>
> **Medium:** HIV prevention and test knowledge score of 8
>
> **Good:** HIV prevention and test knowledge score of 9-11

4.14. Ethical considerations

The proposal was reviewed and approved by the research and ethics committee of the School of Public Health at the College of Health Sciences at Addis Ababa University. Permission to undertake this study was obtained from every relevant authority at all levels (Regional, Zonal

and *Woreda* Health Offices). To facilitate and encourage cooperation, official letters from the School of Public Health was written to Oromia Health Bureau, and then to East Shewa Zone Health Department and respective *Woreda* Offices. Before starting the study, the aim of the study was explained to the W*oreda* Health Offices and the health centres. Sensitization about the study was done at health center levels.

An informed consent form was made available to the study participants. For patients under the age of 18 years, consent was obtained from a parent or guardian first. The informed consent included essential information such as statements of potential risk, benefits, likely breaches of confidentiality and how these will be curtailed. The consent form was in line with the ethical principle of "autonomy" by including statements that give participants the right to decline participation in the study and makes clear that their decision to participate or not to participate will have no effect on their ability and right to receive services at the health center. Data collection instruments didn't include names, address or any other identifying information. During the informed consent process, interviewers explained that the data collected will not be shared with anyone outside the research team to ensure confidentiality. The interview of each study participant took place in a separate room after they give blood. Appropriate measures were also taken to assure confidentiality of the information both during and after data collection. The full English and Afan Oromo versions of the consent form can be found in Annex 3.

4.15. Dissemination of findings

The thesis will be presented to the School of Public Health at Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Public Health in Epidemiology. The results of the study will be communicated to the study health centers, Woreda Health Offices, East Shewa Zone Health Department and Oromia Health Bureau and finally to the Federal Ministry of Health. Findings will be presented on workshops, seminars and conferences of health professionals associations. Finally, the study findings will be published in peer reviewed reputable journals.

5. RESULTS

5.1. Socio demographic characteristics of the study participants

A total of 838 questionnaires were completed, of which 28 (3.3%) were excluded from analysis due to incompleteness and inconsistencies. Analyses were made based on the 810 completed questionnaires, thus the response rate was 96.7%.

A total of 406 (50.1%) HIV testing concerned and 404 (49.9%) unconcerned suspected malaria patients attending the health centres participated in the study (Table 1). One-hundred eighty (22.2%) participants from Batu, 175 (21.6%) from Meki, 169 (20.9%) from Mojo, 147 (18.1%) from Bulbula and the remaining 139 (17.2%) from Shashemene health centre were recruited for this study. About 57% and 43.3% concerned patients, and 60.9% and 39.1% unconcerned patients were from urban and rural areas, respectively. About 52% male and 47% female patients who were concerned and 48.5% male and 53.4% female patients who were unconcerned were participated in the interview respectively. Regarding the sex of household head, 86.2% and 13.8% concerned patients and 88.4% and 11.6% unconcerned patients were male and female respectively. The mean and median ages of the patients were 28 and 27 years old for concerned patients and 29 and 27 years old for patients without concern, respectively.

One hundred eighty eight (46.3%) of the respondents were Orthodox Christians; followed by, Muslim 160 (39.4%) among concerned patients and similarly 174 (43.1%) Orthodox Christian followed by Muslim 165 (40.8%) among unconcerned patients by religion. About 67.7% and 65.3% of the study participants were from Oromo ethnic group followed by Amhara, 60 (14.8%) and 57 (14.1%) among concerned and unconcerned patients respectively. The rest were Gurage, and few others. Regarding the marital status of the participants, 230 (56.7%) was married in union, and 161 (39.7%) were single, among patients who were concerned. While 230 (56.9%) were married in union, and 162 (40.1%) were single from patients who were unconcerned (Table 1).

Table 1 : Socio- demographic characteristics of the study participants by HIV concern in East Shewa Zone, October-November 2012.

Variables		Concerned about HIV testing			
		Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Residence					
Rural		176 (43.3)	158 (39.1)	334 (41.2)	0.220
Urban		230 (56.7)	246 (60.9)	476 (58.8)	
Sex					
Female		189 (46.6)	208 (51.5)	397 (49)	0.160
Male		217 (53.4)	196 (48.5)	413 (51)	
Age					
15-24	Mean= 28.7	159 (39.2)	154 (38.1)	313 (38.6)	0.022
25-34		155 (38.2)	144 (35.6)	299 (36.9)	0.015
35-44		73 (18.0)	69 (17.1)	142 (17.5)	0.028
≥45		19 (4.7)	37 (9.2)	56 (6.9)	
Marital status					
Married		230 (56.7)	230 (56.9)	460 (56.8)	0.217
Single		161 (39.7)	162 (40.1)	323 (39.9)	0.219
Others		15 (3.6)	12 (2.9)	27 (3.3)	
Religion					
Muslim		160 (39.4)	165 (40.8)	325 (40.1)	0.684
Orthodox		188 (46.3)	174 (43.1)	362 (44.7)	0.599
Protestant		13 (3.2)	16 (4.0)	29 (3.6)	0.841
Catholic		43 (10.6)	46 (11.4)	89 (11.0)	0.718
Others		2 (0.5)	3 (0.7)	5 (0.6)	
Ethnicity					
Oromo		275 (67.7)	264 (65.3)	539 (66.5)	0.779
Amara		60 (14.8)	57 (14.1)	117 (14.4)	0.778
Guraghe		34 (8.4)	44 (10.9)	78 (9.6)	0.623
Others		37 (9.1)	39 (9.7)	76 (9.4)	

The educational status of the study group majority were grade nine and above 136 (33.5%) and 151 (37.4%), followed by no formal education 137 (33.7%) and 110 (27.2%) among those who were concerned and unconcerned respectively. Majority of the participants were farmers 145 (35.7%) and 103 (25.5%) followed by students 72 (17.7%) and 91 (22.5), among those who were concerned and unconcerned respectively. Others including housewife, NGO employee, government employee, trader and daily laborer, are also participated in both groups (Table 2).

Two hundred fifty five (62.8%) and 274 (67.8%) had electricity, 310 (76.4%) and 325 (80.4%) had radio, 148 (36.5%) and 179 (44.3%) had television, 130 (32.0%) and 164 (40.6%) had telephone, 63 (15.5%) and 75 (18.6%) had refrigerator, 110 (27.1%) and 96 (23.8) had bicycle among those who were concerned and unconcerned respectively. With regard to nearest health facility to participants; 234 (57.6%) and 234 (57.9%) health centre followed by health post 142 (35.0%) and 132 (32.7%) among those who were concerned and unconcerned respectively. For the majority of the study participants 278 (68.5%) and 294 (72.8%) the distance to the nearest health facility is less than 30 minutes' walk followed by 30 minutes to under one hour walk in 93 (22.9%) and 73 (18.1%) among those who were concerned and unconcerned respectively.

Table 2: Socio- demographic characteristics of the study participants by HIV concern in East Shewa Zone, October-November 2012.

Variables	Concerned about HIV testing			
	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Educational status				
No formal education	137 (33.7)	110 (27.2)	247 (30.5)	0.063
Completed grade 4	50 (12.3)	53 (13.1)	103 (12.7)	0.840
Completed grade 5-8	83 (20.4)	90 (22.3)	173 (21.4)	0.902
Greater than grade 8	136 (33.5)	151(37.4)	287 (35.4)	
Occupation				
Farmer	145 (35.7)	103 (25.5)	248 (30.6)	0.258
House wife	54 (13.3)	66 (16.3)	120 (14.8)	0.825
Daily laborer	25 (6.2)	30 (7.4)	55 (6.8)	0.811
Government employee	35 (8.6)	38 (9.4)	73 (9.0)	0.687
NGO employee	44 (10.8)	53 (13.1)	97 (12.0)	0.808
Trader	26 (6.4)	16 (4.0)	42 (5.2)	0.217
Student	72 (17.7)	91 (22.5)	163 (20.1)	0.866
Others	5 (1.2)	7 (1.7)	12 (1.5)	
Household's ownership of:				
Electricity	255 (62.8)	274 (67.8)	529 (65.3)	0.134
Radio	310 (76.4)	325 (80.4)	635 (78.4)	0.157
Television	148 (36.5)	179 (44.3)	327 (40.4)	0.023
Telephone	130 (32.0)	164 (40.6)	294 (36.3)	0.011
Refrigerator	63 (15.5)	75 (18.6)	138 (17.0)	0.249
Bicycle	110 (27.1)	96 (23.8)	206 (25.4)	0.276
Type of roof				
Thatched	102 (25.1)	80 (19.8)	182 (22.5)	0.02
Corrugated iron	304 (74.9)	324 (80.2)	627 (77.5)	
Nearest health facility				
Health Post	142 (35.0)	132 (32.7)	274 (33.8)	0.151
Health centre	234 (57.6)	234 (57.9)	468 (57.8)	0.213
Public/private hospital	11 (2.7)	10 (2.5)	21 (2.6)	0.361
Private clinic	19 (4.7)	28 (6.9)	47 (5.8)	
Distance of the nearest facility				
Less than 30 minutes' walk	278 (68.5)	294 (72.8)	572 (70.6)	0.194
30 minutes to less than 1 hour walk	93 (22.9)	73 (18.1)	166 (20.5)	0.392
1 hour to less than 2 hours walk	25 (6.2)	28 (6.9)	53 (6.5)	0.196
2 or more hours	10 (2.4)	9 (2.2)	19 (2.3)	

5.2 Knowledge and perception about malaria

Three hundred ninety eight (98%) of those who were concerned and 392 (97.0%) of those who were unconcerned believed that malaria is a major health problem. Regarding the question related to the symptoms of malaria, 340 (83.7%) and 325 (80.4%) feeling cold, 314 (77.3%) and 298 (73.8%) headache, 297 (73.2%) and 264 (65.3%) fever, 201 (49.5%) and 226 (55.9%) vomiting, 199 (49.0%) and 188 (46.5%) sweating, and 197 (48.5%) and 204 (50.5%) loss of appetite by those patients who were concerned and unconcerned respectively. Other reported symptoms were nausea, joint pain and muscle pain (Table 3).

Regarding the cause of malaria all respondents didn't mention correctly which are plasmodium species. There were still misconceptions on the causes of malaria that 181 (93.8%) and 378 (93.6%) mosquito bite, 153 (37.7%) and 123 (30.4%) hunger, 114 (28.1%) and 85 (21.0%) eating maize stalk, and 103 (25.4%) and 93 (23.0%) eating immature sugar cane were the reported misconceptions among those patients who were concerned and unconcerned respectively. Other reported misconceptions were exposure to dirty swampy areas, drinking dirty water, exposure to cold or changing weather, and witchcraft both form patients who were concerned and unconcerned (Table 3).

Four hundred two (99.0%) of those who were concerned and 402 (99.5%) of those who were unconcerned believed that malaria is a curable disease. Similarly almost all the of the study subjects; 404 (99.5%) of those patients who were concerned and 403 (99.8%) those patients who were unconcerned reported that it is important to seek treatment for malaria as soon as possible. Three hundred (73.9%) of those patients who were concerned and 313 (77.5%) those patients who were unconcerned didn't agree with the question that one can stop taking malaria drugs as soon as he/she starts feeling better. Majority (92.6%) of those who were concerned and 383 (94.8%) of those who were unconcerned said that there is a test for malaria (Table 3).

Table 3: Knowledge about malaria prevention and treatment of the study participants by HIV concern in East Shewa Zone, October-November 2012.

Variables	Concerned about HIV testing			
	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Symptoms of malaria				
Fever	297 (73.2)	264 (65.3)	561 (69.3)	0.016
Feeling cold	340 (83.7)	325 (80.4)	665 (82.1)	0.221
Headache	314 (77.3)	298 (73.8)	612 (75.6)	0.236
Vomiting	201 (49.5)	226 (55.9)	427 (52.7)	0.067
Joint pain	116 (28.6)	116 (28.7)	232 (28.6)	0.964
Loss of appetite	197 (48.5)	204 (50.5)	401(49.5)	0.574
Muscle pain	57 (14.0)	55 (13.6)	112 (13.8)	0.861
Nausea	128 (31.5)	106 (26.2)	234 (28.9)	0.097
Sweating	199 (49.0)	188 (46.5)	387 (47.8)	0.480
Cause of malaria				
Mosquito bite	381(93.8)	378 (93.6)	759 (93.7)	0.871
Eating immature sugarcane	103 (25.4)	93 (23.0)	196 (24.2)	0.435
Eating maize stalk	114 (28.1)	85 (21.0)	199 (24.6)	0.020
Hunger (empty stomach)	153 (37.7)	123 (30.4)	276 (34.1)	0.030
Exposure to cold	73 (18.0)	96 (23.8)	169 (20.9)	0.043
Drinking dirty water	79 (19.5)	68 (16.8)	147 (18.1)	0.332
Witchcraft	16 (3.9)	15 (3.7)	31 (3.8)	0.866
Exposure to dirty areas	79 (19.5)	84 (20.8)	163 (20.1)	0.636
Important to seek treatment early				
Yes	404 (99.5)	403(99.8)	807 (99.6)	0.566
No	2 (0.5)	1(0.2)	3 (0.4)	
Discontinue drugs When feeling better				
True	106 (26.1)	91(22.5)	197 (24.3)	0.235
False	300 (73.9)	313 (77.5)	613 (75.7)	

Four hundred three (99.3%) of those who were concerned and 400 (99.0%) of those who were unconcerned believed that malaria is a preventable disease. Out of those who have said malaria is preventable 389 (95.8%) and 378 (93.6%) said sleep under a mosquito ITNs, 218 (53.7%) and 233 (57.7%) said spray house with insecticide, 173 (42.6%) and 195 (48.3%) said drain mosquito breeding sites, and 171 (42.1%) and 150 (37.1%) said avoid mosquito bites as a method of prevention of malaria among those patients who were concerned and unconcerned respectively. Other prevention methods like keeping house surroundings clean, smoking (burn leaves/dung),

and putting screens on windows were also mentioned by both group. Reported misconceptions about the prevention methods of malaria were eating garlic 109 (26.8%) and 17 (29.0%), not drinking dirty water 55 (13.5%) and 59 (14.6%), and drinking alcohol 52 (12.8%) and 32 (7.9%) in those patients who were concerned and unconcerned respectively (Table 4).

Almost all of the FGDs discussants know about malaria; the cause, route of transmission and its prevention. The discussant generally mentioned that malaria is caused by mosquito bite, its seriousness, and further mentioned that it can be prevented by avoiding mosquito breeding sites such as dirty and swampy areas, and ponds as well as using ITN appropriately, and spraying house by chemicals.

A discussant, age 31 male farmer from Meki town said:

"If there are dirty and swampy areas, ponds and weeds which are the favorable breeding sites for mosquitoes, we will be bitten by the mosquito coming from such breeding sites. Therefore malaria is transmitted in such manner. We can prevent malaria by avoiding ponds, cleansing dirty areas, cutting weeds, moreover; using ITN, spraying chemicals. Otherwise in case we develop the symptom, we have to go to health facility and get treatment. We can also go to the health extension workers and get treatment."

Regarding the seriousness of malaria; almost all discussant said that malaria is a very serious, dangerous and killer disease.

A 31years old, male daily labourer from Shashemene town said:

"Malaria is a very severe and devastating disease. Emm (frowningly)….it is a killing disease (twice). We observe many patients lying down here and there; for example if you go to any health center to get malaria diagnosis and treatment , they only diagnose you but they don't give you the drug treatment rather they let you buy the drug somewhere else. As a result, those people who are unable to buy the drug treatment lie here and there dying. So I can understand from this that malaria is a very dangerous disease."

Similarly almost all the respondents of the IDIs mentioned that the community has relatively good knowledge about malaria, which is due to the HEW assigned in the urban and rural to provide health education about malaria and other disease.

A malaria focal person from Mojo health center said:

"Our community's awareness about malaria is better than before. There is a good improvement this is because of the HEWs assigned by our government recently. These HEWs have been giving health education that increases the community's awareness about malaria. Since malaria prevention and control is one of the components of health extension package, they teach the community home to home. But I am not saying that the community's knowledge and awareness about malaria has reached its climax."

Table 4: Knowledge about malaria prevention and treatment of the study participants by HIV concern in East Shewa Zone, October-November 2012.

	Concerned about HIV testing			
Variables	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Malaria is preventable				
Yes	403 (99.3)	400 (99.0)	803 (99.1)	0.844
No	2 (0.5)	2 (0.5)	4 (0.5)	
Didn't know	1(0.2)	2 (0.5)	3 (0.4)	
Prevention method of malaria				
Sleep under a mosquito ITNs	389 (95.8)	378 (93.6)	767 (94.7)	0.154
Avoid mosquito bites	171 (42.1)	150 (37.1)	321 (39.6)	0.147
Spray house with insecticide	218 (53.7)	233 (57.7)	451 (55.7)	0.254
Drain mosquito breeding sites	173 (42.6)	195 (48.3)	368 (45.4)	0.106
Keep house surroundings clean	99 (24.4)	104 (25.7)	203 (25.1)	0.656
Smoking (burn leaves/dung)	58 (14.3)	56 (13.9)	114 (14.1)	0.862
Don't drink dirty water	55 (13.5)	59 (14.6)	114 (14.1)	0.665
Don't eat unhygienic food	48 (11.8)	49 (12.1)	97 (12.0)	0.893
Put screens on windows	35 (8.6)	43 (10.6)	78 (9.6)	0.329
Eat garlic	109 (26.8)	117 (29.0)	226 (27.9)	0.503
Drink alcohol	52 (12.8)	32 (7.9)	84 (10.4)	0.023
Didn't know	1 (0.2)	3(0.7)	4 (0.5)	0.314

The sum of the percentages may not add up to 100% due to multiple responses.

Nearly half (49.5%) of those HIV testing concerned and 206 (51.0%) of those unconcerned malaria suspected patients had any mosquito nets/ITNs that can be used while sleeping. Out of

those who had mosquito nets/ITNs 93 (46.5%) and 102 (49.5%) had two, 66 (33.0%) and 80 (38.8%) had only one, 36 (18.0%) and 18 (8.7%) had three mosquito nets/ITNs among those patients who were concerned and who were unconcerned respectively. Besides, responses on questions asked about the frequency of nights slept under mosquito nets/ITNs in the last fifteen days include; all nights 88 (43.8%) and 100 (48.5%), sometimes 61 (30.3%) and 60 (29.1%), none of the nights 31 (15.4%) and 33 (16.0%), and almost all nights 17 (8.5%) and 9 (4.4%) among those patients who were concerned and who were unconcerned respectively. While 112 (55.7%) of those patients who were concerned and 129 (62.6%) of those patients who were unconcerned, slept under mosquito net/ITNs in the night prior to presentation to the health centre (Table 5).

Table 5: Mosquito nets/ITNs possessation and utilization by households of the study participants by HIV concern in East Shewa Zone, October-November 2012.

	Concerned about HIV testing			
Variables	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Household ownership of ITNs				
Yes	201(49.5)	206 (51.0)	407 (50.2)	0.673
No	205 (50.5)	198 (49.0)	403 (49.8)	
Number of ITNs owned				
1	66 (33.0)	80 (38.8)	146 (36.0)	0.004
2	93 (46.5)	102 (49.5)	195 (48.0)	0.649
3	36 (18.0)	18 (8.7)	54 (13.3)	0.008
4	5 (2.5)	6 (2.9)	11(2.7)	
Frequency of night slept under ITNs in the last 15 days				
All nights	88 (43.8)	100 (48.5)	188 (46.2)	0.822
Almost all nights	17 (8.5)	9 (4.4)	26 (6.4)	0.147
Sometimes	61(30.3)	60 (29.1)	121 (29.7)	0.798
Only few night	4 (2.0)	4 (1.9)	8 (2.0)	0.934
None of the nights	31(15.4)	33(16.0)	64 (15.7)	
Slept under ITNs in the prior night				
Yes	112 (55.7)	129 (62.6)	241(59.2)	0.157
No	89 (44.3)	77 (37.4)	166 (40.8)	

5.3 Knowledge about HIV/AIDS prevention and testing

There was a misconception regarding the question that a person can get HIV from mosquito bites in 124 (30.5%) of those who were concerned and 89 (22.0%) of those who were unconcerned. Regarding patients knowledge about HIV testing; majority (92.6%) of those who were concerned and 383 (94.8%) of those who were unconcerned said that there is a test for HIV/AIDS. Out those who said there is a test for HIV, 347 (85.5%) and 365 (90.3%) government health centre, 274 (67.5%) and 301 (74.5%) government hospital, 165 (40.6%) and 168 (41.6%) mobile VCT units, 110 (27.1%) and 97 (24.0%) private hospital, and 103 (25.4%) and 85 (21.0%) private clinic reported as a sites where one can get confidential HIV test among those patients who were concerned and unconcerned respectively

Majority of the discussants FGDs have knowledge about HIV testing. Moreover; almost all the discussants have a support the necessity of HIV Testing. But majority of the study participants have doubt about the confidentiality of HIV test.

A discussant, age 18 female student, from Batu town, said:

"First there is counseling about HIV then blood will be taken from hand and then the result will we informed to the person with additional counseling. It is better to get tested for HIV and know one's self status. Just one can lead normal life even he/she is positive, so no need to refuse to get tested and hurt oneself. Even if positive for HIV, one can lead normal life by being careful and by refraining from transmitting the disease to others. Therefore it is better to get tested for HIV every three months. With regard to the confidentiality of HIV testing, emm…..I don't know…but I think that there is no health professional that may breach this confidentiality."

But with regard to the confidentiality of HIV test, another discussant, age 20 female student from Batu town said:

"HIV testing is necessary but we have to take care because once they detect the virus in a person they may tell to their friends."

One hundred sixty four (40.4%) of those who were concerned and 203 (50.2%) of those who were unconcerned had visited health facility for treatment of their illness in the past 12 months prior to their concurrent illness. Out of those who were asked by a health worker to give their blood for HIV testing; 107 (85.6%) of those who were concerned and 140 (97.2%) of those who were unconcerned gave their blood for HIV testing and majority (98.1%) of those who were concerned and 136 (97.1%) of those who were unconcerned find out their test result.

Three hundred eight (75.9%) of those who were concerned and 267 (66.1%) of those who were unconcerned have heard of any person in their community who was requested by a health worker in the health facility to give a blood for HIV test (p=0.002). Three hundred six (75.4%) of those who were concerned and 367 (90.8%) of those who were unconcerned; reported that they accept the request of a patient by a health worker in the health facility to give blood for HIV test (p<0.001) (Table 6).

As to the findings of IDIs on knowledge and attitude towards HIV test, majority of the respondents mentioned that the community has a good knowledge about HIV test. This is because of the HEWs that provide health education on HIV test in every Kebele's (a local term for sub city) of the community as explained by the malaria focal person of Meki. But regarding the attitude towards HIV test, all respondent reported that there are people in the community who have negative attitude towards HIV testing. Regarding to the magnitude of people with negative attitude towards HIV testing; majority of respondents said only few people, while some respondents said many people have negative attitude towards HIV testing. Especially those who are educated have negative attitude as mentioned by two respondents. Others such as rich people and those from urban have negative attitude towards HIV testing as expressed by one respondent.

Regarding the knowledge about HIV test a malaria focal person from Batu town reported:

"Of course, they know about HIV testing, they know that HIV is incurable disease, and they know where to go for HIV testing. So I cannot say there is a knowledge gap."

Regarding the attitude, a Health officer who works at OPD of Shashemene health center said:

"About HIV testing…..em….currently we request every patient to undergo HIV test. And many people told us that they already undergone HIV test and when we ask them to undergo HIV test again they never hesitate or refuse to get tested. Many people in the community have a good knowledge about HIV testing; they just need to undergo HIV test. But some people in the community refuse to go for HIV test. This is because there are people who have never undergone HIV test due to the suspicion they have within that they could have been infected by the virus. They just say 'let me think it over and I will come back again.', 'I am not ready to day, I will come back another time.' but many people have the knowledge and undergo HIV test when requested."

To the contrary, a malaria focal person from Meki town reported:

"Many people come here to get diagnosis and treatment for other complaint, not for HIV test. So when we request them to get tested for HIV they just refuse. Specially those people who consider themselves as if they are educated and knowledgeable as well as those who have self risk perception for HIV; prefer to seek treatment elsewhere, this is because of the fear they have within that the health worker could check their HIV status and reveal it to others. This is just a fact."

In agreement with this, a malaria focal person from Batu town said:

"Most of the time we don't see educated people come for HIV testing. Especially civil servants seem to be isolating themselves from HIV testing. Those people who are rich do not come to this government facility rather they go to private clinic or hospital. Poor people, people from the country side, and city street dwellers come to this health facility."

Table 6: Knowledge about HIV/AIDS prevention and testing of the study participants by HIV concern in East Shewa Zone, October-November 2012.

Variables	Concerned about HIV testing			
	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
A person can get HIV from mosquito bites.				
True	124 (30.5)	89(22.0)	213(26.3)	0.182
False	217 (53.4)	252(62.4)	469(57.9)	0.365
Didn't know	65 (16.0)	63(15.6)	128(15.8)	
A healthy looking person can have HIV//AIDS.				
True	357 (87.9)	361(89.4)	718 (88.6)	0.828
False	35 (8.6)	30 (7.4)	65 (8.0)	0.861
Didn't know	14 (3.4)	13 (3.2)	27 (3.3)	
Knew any test that a person can take to determine if he/she has HIV				
Yes	376 (92.6)	383 (94.8)	759 (93.7)	0.673
No	28 (6.9)	18 (4.5)	46 (5.7)	0.378
Didn't know	2 (0.5)	3 (0.7)	5 (0.6)	
Sites for HIV confidential testing				
Gov't health centre	347 (92.3)	365 (95.3)	712 (93.8)	0.085
Government hospital	274 (72.9)	301 (78.6)	575 (75.8)	0.066
Private hospital	110 (29.3)	97 (25.3)	207 (27.3)	0.224
Private clinic	103 (27.4)	85 (22.2)	188 (24.8)	0.097
Mobile VCT units	165 (43.9)	168 (43.9)	333 (43.9)	0.996
Don't know/not sure	5 (1.3)	2 (0.52)	7 (0.92)	0.245
Heard of any person who was requested to give a blood for HIV test				
Yes	308 (75.9)	267 (66.1)	575 (71.0)	0.002
No	98 (24.1)	137 (33.9)	235 (29.0)	
Do you accept or reject the request to give blood for HIV test				
Accept	306 (75.4)	367 (90.8)	673 (83.1)	<0.001
Reject	100 (24.6)	37 (9.2)	137 (16.9)	

The sum of the percentages may not add up to 100% due to multiple responses.

5.4 Concerns about HIV testing in delaying malaria diagnosis and treatment

There was a misconception especially in those who were concerned that; 234 (57.6%) of those who were concerned and 68 (16.8%) of those who were unconcerned reported blood test for malaria and HIV test similar ($p<0.001$). Out of the total 406 respondents who were concerned; 160 (39.4%) are very sure, 141 (34.7%) are somewhat sure, 48 (11.8%) are only a little sure, 34 (8.4%) completely sure and, 23 (5.7%) are not at all sure about the degree to which they are sure that they would get an HIV test if they give their blood sample for malaria testing at health facility. Regarding the question about the magnitude of peoples who are concerned in their community, 164 (40.4%) and 24 (5.9%) said many, 122 (30.0%) and 98 (24.3%) said only few, 57 (14.0%) and 212 (52.5%) said none, 29 (7.1%) and 11 (2.7%) said almost all, and 2 (0.5%) and 3 (0.7%) said all, among those patients who were concerned and unconcerned respectively.

Majority of the discussants of the FGDs believe that people who give blood sample for malaria test will also be tested for HIV without their consent. While nearly half of the discussant do not think that people who give blood sample for malaria test will also be tested for HIV without their consent.

As to the concern a 30 years old male daily labourer from Shashemene town expressed his view;

"Just for example a Jerrycan can be a container for water, or oil, or gas oil…etc since it is a container for any fluid. Therefore the same idea can be applied for laboratory blood test of malaria and HIV. I have a suspicion that health professionals can also test for HIV from the blood sample taken for malaria test. The reason behind why I am saying this is, I had been in to jail once; by the time I was released from jail, I was sick, and my family brought me to health facility to check for malaria and I gave blood sample to check for malaria but the laboratory result indicated Relapsing fever. Therefore we can understand from this that health professionals can also check for HIV from the blood sample taken to check malaria. Just blood for malaria or HIV test is taken from the same area (part of the body). Therefore I believe that they can check for HIV simultaneously."

In addition to this another discussant, age 23 lady from Mojo town expressed her view;

"*Yeah! Because I actually witnessed such kind of experience. Once up on a time my uncle was sick and we brought him to health center. But he refused the request of the health worker to get tested for HIV. By getting consent from us the health worker take blood from him by pretending as if they need it to check for malaria and tested him for HIV, without getting his consent. Therefore, for the sake of keeping our health, they test us for HIV, even if we haven't volunteered to get tested."*

One hundred seventy eight (51.0%) of those who were concerned and 70 (36.3%) of those who were unconcerned have heard of any person in their community who did not go to health facility for malaria testing due to fear of HIV test(P=0.001). Two hundred twenty five (55.4%) those patients who were concerned and 102 (25.2%) who were unconcerned reported that the fear of HIV testing in the health facility is the reason for people to delay from seeking early diagnosis and treatment for malaria at the health facility($p<0.001$) (Table 7).

With regard to the presence of such concern in the community; majority of the FGDs discussant said that there is a concern in the community, while few of the discussants said there is no concern in the community. Majority of those who said that there is a concern in the community reported that there are many people who have the concern while a few discussants said there are only a few people in the community who are concerned. Three discussants said that this concern is common especially in those educated people.

A 32 years old female discussant from Mojo town said;

"So many people have such a concern. I have heard such a concern in my neighbors. Malaria test is done on the blood sample taken from the patient. Isn't it? I have seen many people who left the health facility returning back to their home, when they are asked by a health worker to give blood for malaria test or other disease, because they have a fear that the health worker may test them for HIV from the blood taken for malaria. Just I guess around 50% of the peoples of our community have such concern."

Regarding the presense of concern in the community; a 23 years old trader from Mojo town expressed her view;

"Once I brought my friend to health center in order to get treatment for her illness. After she gave blood sample for malaria, she comes out running from the room because she was in fear that they were going to test her for HIV. I guess there are many people who have such concern."

As well as another discussant, age 20 student from Batu town expressed her view;

"I don't have such kind of concern because malaria test and HIV test is done in different room. Actually there are rumors on such kind of concern in the community but I don't have such kind of concern. Few people in the community have such kind of concern; especially those who are educated or knowledgeable have such kind of fear."

Respondents of the IDIs in Mojo and Meki expressed their view that there are many people in the community who are concerned that if they give blood sample for malaria test, it will also be tested for HIV. While the rest three respondents said only some people are concerned. Educated people, civil servants and merchants are those few people who have such a fear as expressed by exceptionally single respondent. On the other hand those from rural, and those illiterate have such a concern as expressed by exceptionally one respondent.

As to the concern about community, a Health officer who works at OPD of Shashemene health center expressed the incident that he encountered while working at OPD as follows;

"Yeah!!! It so happened to me. Once a lady come here to get treatment for malaria, as we usually do for every patient, I asked her to undergo HIV test, but she didn't accept my request, she told me that she only need to get treated for malaria. She just didn't accept my request. And when I order her to give blood sample for malaria test, she just suspected me that I am going to test her for HIV from the blood sample taken from her. And finally she insulted me rudely, and left the health center without getting any service. She said" you are sitting here to do HIV test only" I was very surprised."

Besides, a malaria focal person from Mojo health center said;

"Yeah currently we are providing a service called PIHCT that every patient who come to the health centre, is requested to undergo HIV test. Due to this many have been experiencing fear when they are asked to give a blood sample for other disease such as malaria. They perceive that

they could also be checked for HIV, from the blood sample. Such fear is widespread in the community."

On the contrary, a malaria focal person of Bulbula town expressed his view;

"Here, HIV testing is done in the OPD, but malaria test is done in the laboratory. Sometimes when we send patients to laboratory to undergo malaria test, they perceive they are going to be tested for HIV. And they say "why should I get tested for HIV, I am free from HIV". Those people who are from the rural areas believe that once blood is taken from them for malaria test, their blood sample is also tested for all other diseases including HIV. But most of the people in our community do not have such kind of fear. But only few people have the fear."

Table 7: Distribution of concerns about HIV testing in delaying malaria diagnosis and treatment by HIV concern in East Shewa Zone, October-November 2012.

	Concerned about HIV testing			
Variables	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Malaria and HIV tests are similar				
Yes	234(57.6)	68(16.8)	302(37.3)	<0.001
No	94(23.2)	240(59.4)	334(41.2)	<0.001
Did not know	78(19.2)	96(23.8)	174(21.5)	
Number of people in the community concerned about HIV testing				
None	57(14.0)	212(52.5)	269(33.2)	0.005
Only few	122(30.0)	98(24.3)	220(27.2)	0.003
Many	164(40.4)	24(5.9)	188(23.2)	<0.001
Almost all	31(7.6)	14(3.4)	45(5.5)	0.870
Did not know	32(7.9)	56(13.9)	88(10.9)	
Heard of any person who didn't go to health facility due to fear of HIV test				
Yes	178(51.0)	70(36.3)	248(45.8)	0.001
No	145(41.5)	96(49.7)	241(44.5)	0.002
Did not know	25(7.4)	27(14.0)	52(9.7)	
Perceived that fear of HIV testing is a reason to delay for malaria diagnosis at health facilities				
Yes	225(55.4)	102(25.2)	327(40.4)	<0.001
No	125(30.8)	209(51.7)	334(41.2)	0.973
Did not know	56(13.8)	93(23.0)	149(18.4)	

5.5 Treatment seeking behavior for malaria

Majority of the respondent reported malaria 299 (73.6%) and 288 (71.3%) as a cause of their current illness; followed by pneumonia 61 (15.1%) and 63 (15.5%), typhoid 18 (4.4%) and 20 (5.0%) among those patients who were concerned and unconcerned respectively. Others such as anemia, typhus, HIV/AIDS, stress, cold, hypertension, and lack of adequate diet were also reported by those patients who were concerned and unconcerned respectively (Table 8).

Only 46 (11.3%) of those who were concerned and 29 (7.2%) of those who were unconcerned sought advice or treatment from any source before coming to the health centre (P= 0.042). Out of those; pharmacy/drug shop 16 (34.7%) and 1 (3.4%), private clinic 15 (32.6%) and 13 (44.8%), health post 12 (26.1%) and 7 (24.1%) were the major sites where they sought advice or treatment among those patients who were concerned and unconcerned respectively. The mean and median duration of arrival to seek the first advice/treatment from other source after their illness began were 3.7 and 3.0 days for concerned patients and 2.1 and 1.5 days for unconcerned patients, respectively.

Ninety five (23.4%) of those who were concerned and 106 (26.2%) of those who were unconcerned had taken any drug at any time during their concurrent illness. Out of which 26 (27.4%) of those who were concerned and 39 (36.8%) of those who were unconcerned had taken anti malarial drugs. Chloroquine 9 (2.2%) and 17 (4.2%), and Coartem 8 (2.0%) and 18 (4.5%) were the anti-malarial durgs taken by majority of those who had taken anti-malarial drugs among those patients who were concerned and who were unconcerned respectively. Condition becoming worse 224 (55.2%) and 200 (49.5%), to get malaria testing 149 (36.7%) and 152 (37.6%) were the reasons for coming to the health centre by majority of those patients who were concerned and unconcerned respectively.

Two hundred forty one (59.4%) of those who were concerned and 216 (53.5%) of those who were unconcerned come to the health center >2 days after the start of their illness episode, with mean and median duration 3.27 and 3.0 days for concerned patients and 2.8 and 3.0 days for unconcerned patients, respectively.

Among those respondents who come ≥1day after the start of their illness episode, mild illness 205 (50.5%) and 233 (57.7%), concerns about HIV testing 127 (31.3%) and 2 (0.5%), lack of time 66 (16.3%) and 71 (17.6%), lack of money 66 (16.3%) and 51 (12.6%), health facility too

far 4 (1.0%) and 13 (3.2%) were the reasons for their delay identified by those patients who were concerned and unconcerned respectively (Table 7).

Table 8: Treatment seeking behavior for malaria of the study participants by HIV concern in East Shewa Zone, October-November 2012.

	Concerned about HIV testing			
Variables	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Perceived cause of current illness				
Malaria	299(73.6)	288(71.3)	587(72.5)	0.930
Pneumonia	61(15.1)	63(15.5)	124(15.3)	
Typhoid	18(4.4)	20(5.0)	38(4.7)	
Others	9(2.2)	12(3.0)	21(2.6)	
I don't know	19(4.7)	21(5.2)	40(4.9)	
Sought treatment from any source before visiting the health center				
Yes	46(11.3)	29(7.2)	75(9.3)	0.042
No	360(88.7)	375(92.8)	735(90.7)	
Source of previous treatment				
Private clinic	15(32.6)	13(44.8)	28(37.3)	0.287
Health post	12(26.1)	7(24.1)	19(25.3)	0.851
Pharmacy/drug shop	16(34.7)	1(3.4)	17(22.7)	0.002
Gov't/private hospital	2(4.3)	3(10.4)	5(6.7)	0.311
Health centre	0(0.0)	3(10.4)	3(4.0)	0.026
Duration of current illness since the onset				
≤2 days	165(40.6)	188(46.5)	353(43.6)	0.091
>2 days	241(59.4)	216(53.5)	457(56.4)	
Reasons for delay				
Thought not serious	204(54.3)	233(65.4)	437(59.7)	0.002
Lack of money	66(17.6)	51(14.3)	117(16.0)	0.234
Concerns about HIV testing	126(33.5)	2(0.6)	128(17.5)	<0.001
Health facility too far	4(1.1)	13(3.7)	17(2.3)	0.020
Lack of time	66(17.6)	71(19.9)	137(18.7)	0.407

The sum of the percentages may not add up to 100% due to multiple responses.

Almost all the discussants mentioned, distance from the health facility, and lack of money as a factors associated with the delay in treatment seeking for malaria. Some discussants mentioned lack of knowledge and awareness about the disease as a reason for delay.Regarding the factors associated with the delay in treatment seeking for malaria; a discussant, age 36 male from Meki town said;

"*Many people seek treatment for their illness after long delay due to many problems such as lack of money, distance from health facility. Just for example, suppose there is a health centre nearby home and I don't have money; I couldn't go and get treatment from the health center. As a result my illness will be exacerbated. The reason behind why they delay is lack of money, not due to negligence. The other reason for their delay is the distance from the health facility, i.e. they hesitate to go to the health facility which is far away."*

Another 22 years old lady discussant from Batu town expressed regarding factors associated with the delay in treatment seeking for malaria by saying;

"Just lack of money is the reason, as well as lack of knowledge. It depends up on your past experience. Those from urban don't delay most of the time because they have the awareness about the disease. But those from rural do delay because they thought that their disease is not serious and self-limiting. As a result their disease will be exacerbated and suffer more."

Majority of the respondents of the IDIs said many people seek treatment lately. The malaria focal person of Mojo expressed his view that though delayed treatment seeking is widespread, there is some improvement in seeking treatment for malaria due to the great role of HEWs. The main reasons cited by majority of the respondents for the delayed treatment seeking are distance, lack of transportation, and lack of money. Lack of awareness, knowledge, and attitude on early treatment seeking due to illiteracy, fear of HIV testing, mild illness, lack of logistics in some health facilities, negligence and fear of blood test are the reason cited by few respondents.

A Health officer who works at OPD of Shashemene health center said;

"Just not only for malaria but also for other disease, I can say that it is a custom for every patient that they do not seek treatment as soon as they start to have symptoms of a disease, because they think their disease is self limiting and just they stay at least 3 or 4 days at their

home. It is just their behavior. There is such kind of custom in the community. Distance from the health facility could also be a reason for their delay. The other reason is lack of money for diagnosis and treatment of malaria. Indeed even though the drug treatment for malaria is for free, malaria testing is not for free and they may not afford it. And the other main reason is as mentioned earlier is due to their negligence or carelessness."

In addition to the above, a malaria focal person from Batu town said;

"Distance from the health facility is one of the reasons for patients to get delayed. The other is, some people panic when they are asked for blood test. They take it that they are being diagnosed for HIV. They complain that "poverty itself is HIV why go for another burden?"

5.6 Laboratory results of the study participants for malaria

Blood films from finger-pricks were done for all the concerned and unconcerned patients to check for malaria parasites using microscopy. One hundred eight (26.6%) the concerned and 96 (23.8%) of the unconcerned patients had microscopically confirmed malaria parasites (p=0.352) (Table 9). Among those who had positive laboratory test result, the dominant *plasmodium* species were *P.vivax* 60 (55.6%) and 51 (53.1%), followed by *P.falciparum* 47 (43.5%) and 45 (46.9%) by those patients who were concerned and unconcerned respectively (Table 9).

Medications were prescribed for almost all (99.8%) of those concerned patients and for all (100%) of those unconcerned patients (Table 8). Out of which, antimalarial drug was prescribed for 110 (27.2%) of those who were concerned and 96 (23.8%) of those who were unconcerned. Among those who has got antimalarial drug prescription, chloroquine 61 (56.0%) and 51 (53.1%), and coartem 47 (43.1%) and 45 (46.9%) were the antimalarial drugs prescribed frequently for those patients who were concerned and unconcerned respectively.

Table 9: Laboratory results of study participants by HIV concern in East Shewa Zone, Oromia Region, October-November2012.

Variables	Concerned about HIV testing			
	Yes, n (%)	No, n (%)	Total, n (%)	*P-value*
Microscopy test result for malaria				
Positive	108 (26.6)	96 (23.8)	204 (25.2)	0.352
Negative	298 (73.4)	308 (76.2)	606 (74.8)	
***Plasmodium* species**				
P. falciparum	47 (43.5)	45 (46.9)	92 (45.1)	0.585
P. vivax	60 (55.6)	51(53.1)	111(54.4)	
Mixed of both	1 (0.9)	0 (0.0)	1(0.5)	
Antimalarial drug prescribed				
Yes	108(27.2)	96(23.8)	204(25.5)	0.276
No	295(72.8)	307(76.2)	602(74.5)	
Type of antimalarial drug prescribed				
CoArtem	47(43.1)	45(46.9)	92(44.9)	0.572
Chloroquine	61(56.0)	51(53.1)	112(54.6)	
Quinine	1(0.9)	0(0.0)	1(0.5)	

5.7 Factors associated with delay in presentation for malaria diagnosis and treatment

This study assessed factors associated with delay in presentation for malaria diagnosis at health centers among adults. A binary logistic regression model was used to examine factors associated with delay in presentation for malaria diagnosis among adults (0= presented to the health center within two days of the onset of illness, 1= presented to the health centre after two days of the onset of illness).

An enter logistic regression analysis method was utilized in three steps in order to find out predictors of delay for malaria diagnosis. The first step was related to the socio-demographic variables, in the second step knowledge about malaria prevention and treatment, knowledge about HIV/AIDS prevention and testing, concerns about HIV testing in delaying malaria diagnosis and treatment, and treatment seeking behavior for malaria was involved, and the last step involved analyzing the joint effects of the variables of socio-demographic, knowledge about malaria prevention and treatment, knowledge HIV/AIDS prevention & testing, concerns about HIV testing, and treatment seeking behavior for malaria on delay in presentation for malaria diagnosis & treatment in order to detect weak associations that may be strong during interactions

with other Variables. Variables with P<0.02 were considered in the first and second step, and variables with P<0.05 were considered for further analysis in the third step.

5.7.1 Socio-demographic determinants of delay in presentation for malaria diagnosis and treatment

The association between socio-demographic characteristics of HIV concerned and unconcerned patients in relation to duration of illness from onset to the time of visiting the health centre was first assessed using bivariate and multivariate logistic regression models. In the bivariate analysis, being in rural, being female, and having no formal education were associated with delay in presentation (Table 10). Controlling for other variables in the logistic regression model, being concerned about HIV testing was associated with delay in presentation (Table 13).

Table 10: Socio-demographic characteristics of study participants associated with delay in presentation and treatment for malaria diagnosis in East Shewa Zone, Oromia Regional, October-November 2012.

	Delayed in presentation, n (%)			
Variables	Yes (>2days)	No (≤2 days)	COR (95% CI)	*P-value*
Residence				
Rural	211(63.2)	123 (36.8)	**1.6(1.2, 2.1)**	**0.001**
Urban	246 (51.7)	230 (48.3)	1	
Sex				
Female	240 (60.5)	157 (39.5)	**1.4(1.1, 1.8)**	**0.023**
Male	217 (52.5)	196 (47.5)	1	
Age				
15-24	170 (54.3)	143 (45.7)	0.7 (0.4, 1.2)	0.168
25-34	169 (56.5)	130 (43.5)	0.7 (0.4, 1.3)	0.282
35-44	82 (57.7)	60 (42.3)	0.8 (0.4, 1.4)	0.399
>45	36 (64.3)	20 (35.7)	1	
Marital status				
Married	274 (59.6)	186 (40.4)	0.7 (0.3, 1.7)	0.466
Single	165 (51.1)	158 (48.9)	0.5(0.2, 1.2)	0.125
Religion				
Muslim	178 (54.8)	147 (45.2)	1.1 (0.7, 1.6)	0.692
Orthodox	214 (59.1)	148 (40.9)	1.3 (0.9, 1.9)	0.201
Educational status				
No formal education	151(61.1)	96 (38.9)	**1.5(1.1, 2.1)**	**0.027**
Completed grade 4	64 (62.1)	39 (37.9)	1.5(0.9, 2.4)	0.066
Completed grade 5-8	94 (54.3)	79 (45.7)	1.1(0.8, 1.6)	0.565
Greater than grade 8	148 (51.6)	139 (48.4)	1	
Distance				
< 30 minutes' walk	311 (54.4)	261 (45.6)	0.8 (0.5, 1.3)	0.280
30 min - 1 hour walk	102 (61.4)	64 (38.6)	1.0 (0.6, 1.9)	0.961
>2 hours walk	44 (61.1)	28 (38.9)	1	

5.7.2 Association of Socio Demographic Characteristics, and Other Variables with Delay in Presentation for Malaria Diagnosis and Treatment

Having poor knowledge about malaria (p=0.065), having ever heard of any person who was requested by a health worker in the health facility to give a blood for HIV test (p=0.927), and rejecting the request of a health worker in the health facility to give blood for HIV test (p=0.317) were not significantly associated with the delay in presentation to health facility for malaria diagnosis and treatment for the overall study participants.

Having ever sought advice or treatment from other source before coming to that health centre [COR (95%CI=5.7(2.9,11.2))], believing that concerns about HIV testing is the reason for people to delay from seeking early diagnosis and treatment for malaria at the health facility [COR (95%CI=1.7(1.2,2.6))], and having ever visited health facility in the prior twelve months to their concurrent illness [COR (95%CI=1.4(1.1, 1.9))], were significantly associated with the delay in presentation to health facility for malaria diagnosis and treatment in the bivariate analysis for the overall study participants (Table 11 and 12). After variables were controlled for confounding factors using multiple logistic regression analysis those who have ever sought advice or treatment from any source before coming to the health center, having good knowledge about HIV prevention and testing, being concerned about HIV testing, and having ever visited health facility in the prior twelve months to their concurrent illness remain associated with the delay in presentation to health facility for malaria diagnosis and treatment for the overall study participants (Table 12).

Majority of the discussants of the FGDs said that having concern has an effect in delaying presentation for malaria diagnosis and treatment.

A discussant, age 32 trader from Mojo town said;

"In my opinion many people go to health facility after long delay because of the fear that the community would stigmatize them if they get tested for HIV and become positive. It is just fear of others. To tell you frankly, I by myself go to health facility very late, i.e when I am severely ill. This is because of the fear I have within that the virus could be detected in my blood."

Another, a 30 years old man from Shashemene town said;

"Yeah (emotionally) most people stay at their home due to the fear that HIV can be detected from the blood sample they gave to check for malaria. Such fear has a very strong effect in delaying presentation to health facility. Just it has 100% effect."

Moreover, another 32 years old construction worker from Shashemene town expressed his view;

"Most of the time people living in urban go to health facility immediately when they are sick. Perhaps some educated people may not go to health facility due to such a fear but most of the people go to health facility immediately when they are sick in fear of death. Those people who have such concern do not go to health facility for diagnosis and treatment rather they buy drug for malaria from pharmacy and take it."

All respondents of the IDIs except the one from Bulbula said having such a concern has an effect in delaying presentation and treatment for malaria in the community. Moreover; regarding the extent of the effect respondents of majority said that it has a strong effect in delaying treatment seeking for malaria.

The malaria focal person from Mojo health center said;

"Yes of course, it has an effect in delaying presentation of patients for malaria diagnosis and treatment. Since there are many people who have such fear in the community, they as a result can stay at their home instead of seeking treatment at the health facility. Therefore it has a very (nodding his head emotionally as to indicate agreement) very strong effect in delaying."

On the other hand, the malaria focal person of Bulbula town expressed his objection;

"I don't think this fear has an effect in delaying presentation for diagnosis and treatment of malaria. No one has stayed home in fear of HIV testing, while having symptoms of malaria."

Table 11: Variables associated with delay in presentation for malaria diagnosis in East Shewa Zone, Oromia Regional, October-November 2012.

	Delayed in presentation, n (%)			
Variables	Yes (>2days)	No (≤2 days)	COR (95% CI)	*P-value*
Knowledge about malaria				
Low	227 (61.7)	141 (38.3)	1.4 (0.9, 2.0)	0.065
Medium	135 (51.1)	129 (48.9)	0.9 (0.6, 1.3)	0.7
Good	95 (53.4)	83 (46.6)	1	
Knowledge about HIV testing and prevention				
Low	165 (58.5)	117 (41.5)	1.1 (0.8, 1.5)	0.632
Medium	120 (52.4)	109 (47.6)	0.9 (0.6, 1.2)	0.375
High	140 (56.5)	108 (43.5)	1	
Visited health facility in the prior 12 months				
Yes	224 (61.0)	143 (39.0)	**1.4 (1.1, 1.9)**	0.016
No	233 (52.6)	210 (47.4)	1	
Heard of any person who was requested to give a blood for HIV test				
Yes	325 (56.5)	250 (43.5)	1.0 (0.8, 1.4)	0.9
No	132 (56.2)	103 (43.8)	1	
Do you accept or reject the request to give blood for HIV test				
Accept	385 (57.2)	288 (42.8)	1.2 (0.8, 1.8)	0.3
Reject	72 (52.6)	65 (47.4)	1	

Table 12: Determinants of delayed presentation associated with delay in presentation for malaria diagnosis in East Shewa Zone, Oromia Regional, October-November 2012.

Variables	Delayed in presentation, n (%) Yes (>2days)	No (≤2 days)	Crude OR (95% CI)	*P-value*
Malaria and HIV tests are similar				
Yes	165 (54.6)	137 (45.4)	1.1 (0.8, 1.5)	0.678
No	177 (53.0)	157 (47.0)	1	
Concerned about HIV testing				
Yes	241 (59.4)	165 (40.6)	1.3 (0.9, 1.7)	0.091
No	216 (53.5)	188 (46.5)	1	
Number of people in the community concerned a about HIV testing				
None	108 (40.1)	161 (59.9)	0.7 (0.3, 1.1)	0.059
Only few	150 (68.2)	70 (31.8)	1.6 (0.9, 2.7)	0.060
Many	121 (64.4)	67 (35.6)	1.4 (0.8, 2.3)	0.230
Almost all	28 (62.2)	17 (37.8)	1.3 (0.6, 2.6)	0.550
Didn't know	50 (56.8)	38 (43.2)	1	
Heard of any person who didn't go to health facility due to fear of HIV test				
Yes	169 (68.1)	79 (31.9)	1.3 (0.9, 1.8)	0.238
No	259 (50.9)	250 (49.1)	1	
Perceived that fear of HIV testing is a reason to delay for malaria diagnosis at health facilities				
Yes	222 (67.9)	105 (32.1)	**2.5 (1.8, 3.4)**	<0.001
No	153 (45.8)	181 (54.1)	1	
Sought treatment Elsewhere before				
Yes	65 (86.7)	10 (13.3)	**5.7 (2.9, 11.2)**	<0.001
No	392 (53.3)	343 (46.7)	1	
Microscopy test result for malaria				
Positive	120 (58.8)	84 (41.2)	1.1 (0.8, 1.6)	0.424
Negative	337 (55.6)	269 (44.4)	1	
***Plasmodium* species**				
P. falciparum	54 (58.7)	38 (41.3)	0.9 (0.6, 1.7)	0.9
P. vivax	66 (59.5)	45 (40.5)	1	

Among all, those who have ever sought advice or treatment from any other source before are nearly five times more likely to delay when compared to those who haven't [Adjusted OR=4.9; 95%CI (2.4, 10.0)], those who had good knowledge about HIV prevention and testing are 1.5 times more likely to delay when compared to those who have poor knowledge [Adjusted OR=1.5; 95%CI (1.0, 2.2)], those patients who are concerned about HIV testing are 1.4 times

more likely to delay when compared to those who have no concern about HIV testing[Adjusted OR=1.4; 95%CI (1.1, 1.9)], and those who have ever visited health facility in the prior twelve months to their concurrent illness are 1.4 times more likely to delay when compared to those who haven't [Adjusted OR=1.4; 95%CI (1.1, 1.9)]. The other variables were not significantly associated with delay in presentation for malaria diagnosis and treatment after adjusting for confounders (Table 13).

Table 13: Determinants of delayed presentation associated with delay in presentation for malaria diagnosis in East Shewa Zone, Oromia Regional, October-November 2012.

	Delayed in presentation, n (%)			
Variables	**No (≤2days)**	**Yes (>2 days)**	**Crude OR (95% CI)**	**Adj. OR (95% CI)**
Concern about HIV testing				
Yes	165	241	1.3 (0.9, 1.7)	**1.4 (1.1, 1.9)***
No	188	216	1	1
Knowledge about Malaria				
Low	25	74	1.4 (0.9, 2.0)	1.5 (0.9, 2.2)
Medium	290	347	0.9 (0.6, 1.3)	1.2 (0.6, 1.4)
Good	38	36	1	1
Knowledge about HIV testing and Prevention				
High	108	140	0.9 (0.7, 1.3)	**1.4 (1.0, 2.2)***
Medium	213	256	0.8 (0.6, 1.1)	1.0 (0.7, 1.5)
Low	13	129	1	1
Visited health facility in The prior 12 months				
Yes	10	65	**1.4 (1.1, 1.9)**	**1.4 (1.1, 1.9)***
No	343	392	1	1
Sought treatment Elsewhere before				
Yes	143	224	**5.7 (2.9, 11.2)**	**4.9 (2.4, 10.0)****
No	210	233	1	1

**- Significance level of <0.001
*- Significance level of <0.05

6. DISCUSSION

This study provides information regarding the effect of concerns about HIV testing in delaying early presentation for malaria diagnosis and treatment among adults in malaria endemic areas located in the great rift valley of southeast Ethiopia. This study has demonstrated that the delay in presentation for malaria diagnosis and treatment 56.4% with which seeking advice or treatment elsewhere, having good knowledge about HIV prevention and testing, being concerned, and having ever visited health facility in the prior twelve months to their concurrent illness were significantly associated.

The overall delay in presentation of 56.4% of this study was lower than the study conducted before in the same area 74.5%, in Butajira 65% and in Srilanka 67% (7, 28, 29). In the present study the reduced prevalence of delay could be due to the high knowledge of respondents about malaria which in turn could be due to the great role of HEWs. This is also supported by the result of IDI that indicates some improvement in seeking treatment for malaria due to the great role of HEWs.

Seeking advice or treatment from any other source before presentation to the health center was associated with delay in presentation. This could be due to the time elapsed to see the effect of the treatment taken from other sources. In addition, majority (61%) of the patients who sought advice or treatment from any source before were concerned about HIV testing which in turn could cause patients to seek advice or treatment from other source or stay at home with the hope that their illness would be self limiting, and as a result they would go to health facility after long delay after their illness is exacerbated. It was only 9.3% who sought advice or treatment from any other sources such as private clinics, health posts, and pharmacies/drug shops. This is in agreement with the study done in the same area before in which only 13.3% of malaria patients took medications from different sources such as pharmacies and drug shops, and private clinics (7). In countries where malaria is endemic, failure or delay in seeking treatment of common symptoms such as fever or headache from providers of effective case management may have fatal consequences. Although there is convincing evidence that use of ineffective anti-malarial drug therapy may be responsible for increasing mortality trends in sub-Saharan Africa, arguably an equally important contributor to the problem is the observed practice of self-medication and increased reliance on informal sources of care (27). The main disadvantage of seeking treatment

at health facility after taking medications somewhere else is favoring the chance of false negatives, as the parasites can be inactive or scanty in the peripheral blood (7).

Having good knowledge about HIV prevention and testing was significantly associated with delay in presentation to health facilities for malaria diagnosis. Similarly the results of the FGDs and IDIs of this study also indicated that people who are educated and knowledgeable are concerned about HIV testing as a result they delay in seeking treatment. This could be due to the reason that having good knowledge doesn't necessarily mean to have positive attitude. On the contrary a study done in Ghana (60) indicated that the more literate households tend to seek treatment from a private health care provider than self medicate, and they are also likely to choose a public health care provider over self-care. In this study educational status has no significant association with delay in presentation.

Being concerned about HIV testing was significantly associated with delay in presentation OR=1.4; 95%CI (1.1, 1.9). This could be explained by the reason that if patients are concerned about HIV testing they do not seek treatment in health facility rather they seek treatment from informal sources such as using traditional treatment, buying drugs from pharmacies or drug shops. Gradually, finally when their illness is aggravated they either go to health facility to seek treatment or stay at their home with hope that it would be self limiting. This finding might be underestimated by many factors. For instance those patients who were concerned about HIV testing and as a result stay at their home at all without seeking treatment from health facility, could under estimate the delay in presentation among those who were concerned. Moreover it is not a common practice in the community to seek treatment immediately after they start to have symptoms of a disease regardless of the fear of HIV testing, which could dilute the association between being concerned and delayed presentation of patients for malaria diagnosis. This is in agreement with the findings of qualitative research of this study that being concerned about HIV testing has a strong effect in delaying presentation and treatment for malaria. Hence there are many people who do not seek treatment in health facility due to the being concerned about HIV testing.

Both the quantitative and qualitative findings of this study indicated that there are many people who are concerned about HIV testing in the community. A qualitative study conducted in Uganda indicates there was fear that RDTs used at drug shops could be used to test for HIV when people have not consented to know their status (10). Similarly another qualitative study done in Uganda indicates that some people think that when they are pricked to test the blood for malaria, they think they are being tested for HIV but not malaria. They believe health professionals can prove malaria by mere looking at signs like vomiting, shivering, and other basic signs (5). Likewise, a qualitative study done in Tanzania indicates, there were marked fears in the community that the RDT would be used to identify HIV/AIDS and not malaria (61). This could be due to the similarity of the shape of RDT and KHB as well as blood sample is taken from finger prick for both RDT and KHB which could lead to such concern or fear in the rural areas where RDT is done to check malaria in health posts. Therefore patients who do not want their HIV status disclosed could refrain from seeking treatment due to the fear that health workers could check them for HIV instead of malaria or simultaneously for both HIV and malaria.

More than half (57.6%) of those who were concerned believed that blood test for malaria and HIV is similar which is relatively higher when compared with those who were unconcerned (16.8%). This misconception could make patients concerned about HIV testing when they visit health facility for malaria diagnosis and treatment. More than half (51%) of those who have concern have heard of a person in their community who did not go to health facility for malaria testing due to fear of HIV test, which is relatively higher than those who were unconcerned (36.3%). This (having ever heard) could have influenced them to have such concern which in turn can result in delay for malaria diagnosis and treatment.

Having ever visited health facility in the prior twelve months to the concurrent illness is also significantly associated with delay. This could be explained by the reason that currently there is a routine practice called PIHCT (Provider Initiated HIV Counseling and Testing) that, every patient is requested to get tested for HIV as part of the routine clinical practice. Therefore this practice could make patients concerned about HIV testing which in turn can make them not to seek treatment in the health facility or seek lately when their illness is worsened.

The study participants were classified in to HIV testing concerned and unconcerned malaria suspected patients by a screening question which asks whether they are concerned about HIV testing when they visit a health facility for malaria diagnosis and treatment. Hence the classification was based on the subjective response of the study participants which could have been caused misclassification of study participants due to social desirability bias.

According to the Abuja declaration and the national strategic plan for malaria, prevention, control and elimination of FMOH of Ethiopia, seeking treatment for malaria after 24 hours of the onset of illness is considered as delayed. In our study those malaria suspected patients presented to the health centers after 48 hours of the onset of illness were considered as delayed. But studies conducted in Ethiopia (7, 30) indicated that the proportion of patients presented to health facility within 24 hours is very low, which in turn would make the comparison between early and delayed presentation difficult. Therefore, in our study for the purpose of having a good comparison of delay between those HIV testing concerned and unconcerned malaria suspected patients, the definition of delayed presentation was changed to the presentation to the health centre after two days (48 hours) of the onset of illness.

The prevalence of malaria in this study is lower than the 2010/11 prevalence of malaria in East Shewa zone. This could be due to the inclusion of malaria positive cases detected by RDTs in the 2010/11 prevalence of malaria in East Shewa zone unlike our study. Another study done in Jimma revealed that malaria parasite prevalence was 5.2% of which *P. vivax* accounts for 71.4%, *P. falciparum* 26.2% and mixed infection only accounts 2.4%. The low malaria prevalence of the study conducted in Jimma compared with our study could be attributed to the study period which was done during the minor malaria transmission season between April and May as well as a community based study unlike our study which was a facility based done on malaria suspected patients (20).

Generally, high proportions of *P. falciparum* cases are expected in Ethiopia during the peak malaria transmission particularly in October. The national figure of 30%-40% of malaria cases in Ethiopia being due to *P. vivax (18)*. In Oromia, however, *P. vivax* was the main etiologic agent of cases confirmed by microscopy, with 60% of slide-positive cases (16) which is in agreement with the findings of this study. In this study the prevalence of *P. vivax* is higher than *P.*

falciparum which indicates a trend shift. The possible reason for this trend shift from *P. falciparium* to *P. vivax* could be due to the public health importance of *P. vivax* that has been frequently overlooked and left in the shadow of the enormous problem caused by *P. falciparum (62).*Moreover, the prevention and control activities of malaria in Ethiopia (19) mainly focus on *P. falciparium*. Other possible reasons might be climate variability and *P. vivax* might have developed resistance for chloroquine (63). A study conducted in East Shewa indicated that both *P. falciparum* and *P. vivax* were responsible for the causes of 52.6% and 47.4% of overall malaria illnesses among the study subjects, respectively, which indicated decrement of *P. falciparum*, and slight increment of *P.viax* (7).

The study participants were aware of the curability of malaria (99.3%) and identified malaria as a major health problem (97.5%) both in those who have concern and who have no concern. Feeling cold, headache and fever was the most frequently reported malaria symptom. Most of the respondents (99.9%) were able to mention at least one symptom of malaria, 94.6% could mention three symptoms or more. A similar study done in Tigray indicates 92.7% believed that malaria can be cured, and shivering, body pains, and fever. Most of the respondents (92.7%) were able to mention at least one symptom of malaria and 65.3% could mention three symptoms or more (37).

The level of knowledge of malaria in our study population appears to be relatively good, and may be related to the relatively good level of education and literacy of the study population. Moreover, almost all of those concerned and unconcerned supported the importance of seeking treatment for malaria immediately. This result is consistent with the findings of the qualitative research of this study that the community's knowledge about malaria has been improving from time to time due to HEWs who has played a major role by giving health education about malaria.

In this study, majority of the study participants were aware that one could check his/her HIV status. This result is comparable with the result observed in Gondar (89.8%) and in Bahirdar (83%) (52, 53). Besides, majority of the study participants of this study reported they would accept if they are asked to get tested. But high theoretical acceptability doesn't necessarily guarantee for high practical acceptability. Even though the community has good knowledge

about HIV testing, there are some people especially those educated, who have negative attitude towards HIV testing though as indicated by the IDI of this study.

Early recognition of malaria symptoms like fever and subsequent treatment with an effective anti-malarial is essential to reduce morbidity, mortality and complications due to malaria. Better understanding of community's treatment-seeking behavior is crucial for the disease control programs to plan and implement, and utilize available resources efficiently. Majority (90.4%) of the study participants presented to the health facility after twenty four hours (one day) after the onset of their illness. The main reasons cited for the delay in this study were mild illness, lack of time, being concerned about HIV testing, and lack of money. This is comparable with the study conducted in the same area that majority (94.9%) presented after twenty four hours due to mild illness, high workload, financial problem, and thought of other diseases(7). Almost all the discussants of the FGD of this study mentioned that distance from the health facility, and lack of money as a factors associated with the delay in treatment seeking for malaria. Some discussants mentioned lack of knowledge and awareness about the disease as a reason for delay. Since delay in seeking care leads to more advanced disease at the time of presentation to health services, and malaria associated morbidity and mortality, promotion of early presentation and treatment is of critical importance.

Generaly, the overall delay in this study is slightly decreased. The younger age group is the majority subgroup participated in the study. Seeking treatment elsewhere, being concerned about HIV testing has shown delayed presentation for the diagnosis treatment of malaria among adults.

7. STRENGTHS AND LIMITATIONS OF THE STUDY

7.1 Strengths

1. No study has been conducted before on the effect of concern in delaying presentation and treatment for malaria. Therefore; this study could be used as a baseline for other studies.
2. Being concerned about HIV testing has an effect in treatment seeking of not only malaria but also other diseases diagnosed by blood test. Therefore this study has investigated a crosscutting determinant for delayed treatment seeking.

7.2 Limitations

1. Self report may introduce social desirability bias. As a result those who were concerned about HIV testing might have been included in the other group (those who were unconcerned)
2. Classification in to HIV Concerned and unconcerned was based on the subjective response of the study participants which could have been caused misclassification.
3. This study didn't include those patients who have stayed at their home at all due to the concern about HIV testing which could under estimate the proportion of those patients who have concern as well as its effect on delay in treatment seeking.
4. This study is a health facility based study which included only government health facilities.
5. Recall bias could have been introduced in ascertaining the duration of time from the onset of illness which is highly dependent on the respondent's ability to recall.

8. CONCLUSIONS

- One of the main control strategies for malaria is to reduce morbidity and mortality from malaria through early diagnosis and prompt treatment. Unfortunately, a large proportion of malaria cases seek treatment at health centers three or more days after the onset of malaria illness with indicating an extreme delay in early diagnosis and treatment.
- Being concerned about HIV testing has a major effect in delaying early presentation and treatment of malaria, which must be considered in prevention of malaria morbidity and mortality.
- The key perceived barrier for early presentation and treatment for malaria were mild illness, being concerned about HIV testing, lack of money, and lack of time
- Despite the high knowledge on malaria and HIV testing, still there is misconception which requires provision of health education and expanding IEC to raise awareness of the study participants.
- There is a high proportion of malaria positivity. The burden of *P.vivax* is very high when compared with P. falciparum, despite high proportions of *P.falciparum* is expected during the peak malaria transmission specialy in October and December which indicates a trend shift.

9. RECOMMENDATIONS

- The high proportion of patients who support the importance of early treatment seeking for malaria in this study is encouraging result that needs further strengthening of health education.
- Strengthening of IEC/BCC through different channels especially by using mass media and peer education on early treatment for malaria and the difference between malaria testing and HIV testing to address barrier to early presentation and treatment for malaria
- FMOH of Ethiopia especially health bureau of East shewa zone of Oromia region as part of the malaria prevention and control program, should promote health education regarding HIV testing in order to avoid the concern about HIV testing which has a major impact in delaying, and the need of early treatment seeking for malaria is being given at community and health facility level.
- A large proportion of malaria cases are due to *P. vivax.* Therefore the malaria prevention and control program which mainly focus on *P. falciparum* should also focus on *P.vivax*.
- This study takes in to consideration only those patients who come to the health facility. Other studies must be done at the community level in order to get those patients who stay at their home at all.

10. REFERENCES

1. UN. Interagency Group Child Mortality Estimation. Levels and trends in Child Mortality. Child mortality report. 2010;20(4):20-1.
2. UNICEF. Malaria in EThiopia. Addis Ababa Ethiopia: 2008.
3. PMI. Malaria operational plan(MOP) Ethiopia. 2012:8-31.
4. UNAIDS. Voluntary Counseling and Testing (VCT). 2000;2:23-44.
5. Mukanga D, Tibenderana J.K, Kiguli J, et al. Community acceptability of use of rapid diagnostic tests for malaria by community health workers in Uganda. Malaria Journal 2010;9(4):203-9.
6. Phan T. Giao PJ, de Vries, et al. Early diagnosis and treatment of uncomplicated malaria and patterns of health seeking in Vietnam. Tropical Medicine and International Health. 2005;10:919–25
7. Deressa W, Chibsa S, Olana D. Treatment Seeking of Malaria Patients in East Shewa Zone of Oromia. Ethiopia Ethiop J Health Dev. 2003;17(1):9-16.
8. Maria N, Shangula. Factors affecting voluntary counseling and HIV testing among pregnant women in Tsumeb district, Oshikoto region, Namibia. November 2006:34-45.
9. Winfred N, Okarley Armah. Review of HIV councelling and testing related stigma in Ghana. ICHD September 2011:12-22.
10. Mbonye AK, Ndyomugyenyi R, Turinde A, et al. The feasibility of introducing rapid diagnostic tests for malaria in drug shops in Uganda. Malaria Journal. 2010;9:367.
11. Trampuz T. Clinical review of Severe malaria. August 2003;7:315-23.
12. WHO. World Malaria Report 2011.Available at http://www.who.int/entity/malaria/world_malaria_report_2011/9789241564403_eng.pdf. 2011.
13. WHO. World Malaria Report 2010: Available at http://whqlibdoc.who.int/publications/2010/9789241564106_eng.pdf. 2010.
14. WHO. World Malaria Report 2012. 2012.
15. Breman J, Alilio M, Mills A. Conquering the intolerable burden of malaria: what's new, what's needed a summary. Am J Trop Med Hyg. 2004:1-15.
16. EHNRI. Ethiopia National Malaria Indicator Survey 2011. 2012:1-48.
17. Ethiopia. EDP. Trends in Malaria at Epidemic Detection Sites in the Oromia Region, Ethiopia. Ethiopia: 2010.
18. Carter C. Annual malaria control program review enhancing impact through integrated strategies malaria programs Ethiopia and Nigeria. Atlanta, Georgia: 2012.
19. FMOH. National Five Year Strategic Plan for Malaria Prevention and Control in Ethiopia: 2006-2010 Addis Ababa: FMOH; 2006.
20. Alemu A, Tsegaye W, Golassa L, et al. Urban malaria and associated risk factors in Jimma town, south-west Ethiopia. Malaria Journal. 2011;10:173.
21. Cummings K.M, Becker M.H, Maile MC. Bringing the models together: an empirical approach to combining variables used to explain health actions. Journal of Behavioral Medicine. 1980;3:123-45.
22. Susanne. HM. Community understanding of malaria, and treatment-seeking behaviour, in a holoendemic area of southeastern Tanzania. June 2000:31-9.
23. Agyepong I, Manderson L. The diagnosis and management of fever at household level in the Greater Accra Region, Ghana. Acta Trop 1994;58:317-30.
24. Mwenesi H, Harpham T, Snow RW. Child malaria treatment practices among mothers in Kenya. Soc Sci Med 1995;40:1271-7.

25. Ruebush T, Kern MK, Campbell CC, Oloo AJ. . Self-treatment of malaria in rural areas of western Kenya. Bull World Health Organ. 1995;79:229-36.
26. AbujaWHO. The Abuja Declaration on Roll Back Malaria in Africa by the African Heads of States and Governments Abuja, Nigeria. Geneva: WHO. 25th April 2000.
27. Ruben E, Mujica Mota. Health Seeking Behavior after Fever Onset in a Malaria-Endemic Area of Malawi. Am J Trop Med Hyg. 2009;81(6):935–43.
28. Deressa W, Ali A, Enquesellassie F. Self-treatment of malaria in rural communities, Butajira District, southern Ethiopia. Bulletin the World Health Organization. 2003;81(4):261-8.
29. Reilley B, R.Abeyasinghe, M. Vincent Pakianathar. Barriers to prompt and effective treatment of malaria in northern Sri Lanka. Tropical Medicine and International Health. september 2002;7(9):744–9
30. Deressa W. Treatment-seeking behaviour for febrile illness in an area of seasonal malaria transmission in rural Ethiopia. Malaria Journal 2007;6:49.
31. Elfatih M, Malik. From home to hospital: beliefs and practices related to severe malaria in Sudan national malaria control program, University of Juba, Sudan. Journal of the Saudi society of family & community medicine 2005;12(2):2-5.
32. Matta S, A Khokhar, TR Sachdev. Assessment of knowledge about malaria among patients reported with fever: a hospital-based study. J Vect Borne Dis. June 2004;41.
33. Mabuza M, Marline Booman. Community knowledge and perception about malaria and practices influencing malaria control in Mpumalanga province South Africa. South African Med J. 2000;90:611-6.
34. Iriemenam N, et al. Knowledge, attitude, perception of malaria and evaluation of malaria parasitaemia among pregnant women attending antenatal care clinic in metropolitan Lagos, Nigeria J Vector Borne Dis 48. March 2011:12–7.
35. Agyepong, IA. Malaria: Ethnomedical perceptions and practice in an Adange farming community and implications for control. Soc Sci Med. 1992;35(2):131-7.
36. Deressa W, Ali A, Enqueselassie F. Knowledge, Attitude and Practice About Malaria, the Mosquito and Antimalarial Drugs in a Rural Community Ethiop J Health Dev.101-5.
37. Paulander J, Olsson H, Lemma H, et al. Knowledge, attitudes and practice about malaria in rural Tigray, Ethiopia. Global Health Action. 2009:3-4.
38. Ongore D, Kamunvi F, Knight R, Minawa A. Study of knowledge, attitude and practice (KAP) of a rural community on malaria and the mosquito vector. East African Med J 1989;66(2):79–89.
39. Singh T, Singh RKN, Singh EY. A study of knowledge about malaria and treatment seeking behavior in two tribal communities of Manipur. Indian J Pub Hlth 2003;47(2):61–5.
40. Rasania S, Bhanot A, Sachdev TR. Awareness and practices regarding malaria of catchment population of a primary health center in Delhi. J Com Dis. 2002;34(1):78–84.
41. Vundule C, Mhara Kurula S. Knowledge, practices and perception about malaria in rural communities of Zimbabwe: relevance to malaria control. Bull WHO 1996;74(1):55–60.
42. Kevin baird J. Survey of community knowledge, attitudes, and practices during a malaria epidemic in central java, Indonesia. Am J Trop Med Hyg. 2006;75(5):783-9.
43. Okello OF. Knowledge, Attitudes and Practices Related to Malaria and Insecticide Treated Nets in Uganda (unpublished report). . Uganda: 2001.
44. NetMark. Net Mark baseline survey on insecticide treated materials in Uganda. Net Mark/AED Kampala. Uganda: 2001.
45. Kamb M, Fishbein M, Douglas JM, et al. Efficacy of riskreduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases. Journal of the American Medical Association. 1998;280:1161-7.

46. Castro A, Farmer P. Understanding and addressing AIDS-related stigma: From anthropological theory to clinical practice in Haiti. Am J Public Health 2005;95: 53–9.
47. Haidet P, Stone DA, Taylor, W, et al. . When risk is low: primary care physicians' counseling about HIV prevention, Patient Education and Counseling 2002 Contract No.: 21-29.
48. Harries A, Zachariah R, Lawn SD. Providing HIV care for co-infected tuberculosis patients: a perspective from sub-Saharan Africa. Int J Tuberc Lung Dis. 2009;13(1):6-16.
49. UNAIDS. global reference group on HIVAIDS and human rights. UNAIDS /WHO policy statement on HIV testing. 2004.
50. Nyblade L, Pande R, Mathur S, MacQuarrie K, Kidd R, et al. . Disentangling HIV and AIDS stigma in Ethiopia, Tanzania and Zambia. Washington, DC: International Center for Research on Women. 2003.
51. Cameron E. the deafening silence of AIDS. Health Hum Rights. 2000:7–24.
52. Michael D. Factors Affecting Accessibility and Acceptability of Voluntary Counseling and Testing Services for HIV/AIDS in Bahir Dar town, North Western Ethiopia. November 2001:24-36.
53. Shitaye A. Knowledge and attitude towards voluntary counseling and testing for HIV:A community based study in northwest Ethiopia EthiopJHealth Dev 2004;18(2):83-9.
54. CSA[Ethiopia], ICFInternational. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland USA: Central Statistical Agency and ICF International; 2012.
55. Wei MA. Acceptance of and barriers to voluntary HIV counselling and testing among adults in Guizhou province, China. AIDS Author Manuscript. December 2007;21(8):129–35.
56. Tawanda M. The attitudes towards HIV testing among Mall Clinic patients in Botswana. 2010:15-7.
57. Steve FM, & Femi, R.T. Attitudes of youths towards HIV testing in Nigeria. The Social Sciences. 2007;2(2):231-5.
58. CSA. The 2007 population and housing census of Ethiopia: Results for Oromia Regional State. Addis Ababa: 2007.
59. FMOH. National Malaria Guidelines. 3 ed. Addis Ababa.2012.
60. Janet D, John Asafu. A study of malaria care provider choice in Ghana. 2002.
61. Williams H.A, Causer L, Metta E, et al. Dispensary level pilot implementation of rapid diagnostic tests: an evaluation of RDT acceptance and usage by providers and patients,Tanzania. Malaria Journal 2008. 2005;7:239.
62. Baird J. Neglect of Plasmodium vivax malaria. . Trends Parasitol. 2007;23:533–9.
63. Alemu A, Tesfaye W, Golassa L, Abebe G. Climatic variables and malaria transmission dynamics in Jimma town, South West Ethiopia. Parasit Vectors 2011;4:30–41.

11. ANNEXES

Annex 1: Data Collection Tools

Assessment of Concerns about HIV Testing in Delaying Early Presentation And Treatment for Malaria among Adults in East Shewa Zone of Oromia Region, Ethiopia

No.	Identifications	Response
1	Questionnaire number	
2	Region	
3	Zone	
4	Woreda	
5	Kebele	
6	Name of Health Center	
7	Name of interviewer	
8	Name of supervisor	
9	Date (dd/mm/yy)	/_____/_____/2005 EC

SCREENING QUESTION (ADULTS)

Are you concerned about HIV testing when you visit a health facility for malaria diagnosis and treatment?

1. **Yes**
2. **No**

Section 1: Socio-demographic characteristics of the respondents

No.	Questions and filters	Response categories	Skip
1	What is your place of residence (rural/ urban)?	Rural 1 Urban 2	
2	Sex of the respondent	Female 1 Male 2	
3	How old are you?	Response in years /_____/	
4	What is the sex of head of the household?	Male 1 Female 2	
5	What is your current marital status?	Married 1 Never married (single) 2 Divorced 3 Widowed 4 Separated 5	
6	What is your religion?	Muslim 1 Orthodox 2 Protestant 3 Catholic 4 Other(specify)_____ 5	
7	To which ethnic group do you belong?	Oromo 1 Amhara 2 Guraghie 3 Kambata 4 Hadiya 5 Tigre 6 Other(specify) _____ 7	
8	What is the highest level of school or grade you have completed?	Unable to read or write 1 Can only read and write 2 Primary Cycle 1 (1-4) 3 Primary Cycle 2 (5-8) 4 Secondary (9-12) 5 TVET(10+1 or 10+2) 6 TVET(10+3 /Diploma 7 University Degree or Above 8 Other (specify)_____ 9	
9	What is your current main work/occupation? • ***Choose only one response***	Farmer 1 Housewife 2 Daily labourer 3 Government employee 4 NGO employee 5 Trader 6 Student 7 Other (specify)_____ 8	

10	Does your household have: Electricity? A functional Radio? A functional Television? A functional Telephone? A functional Refrigerator? A functional Bicycle?	**Yes No** Electricity .....1 2 Functional RADIO .....1 2 Functional TELEVISION…...1 2 Functional TELEPHONE…..1 2 Functional REFRIGERATOR..1 2 Functional Bicycle……. 1 2	
11	What is the main material of the roof of house of your household?	Thatched ..... 1 Corrugated iron……2 Other (Specify)……3	
12	What is the health care facility that is nearest to your home?	Health post 1 Health center 2 Public/private hospital 3 Private clinic 4 Don't know 5 Other (specify)_____ 6	
13	How far is this health facility from your home?	Less than 30 minutes' walk 1 30 minutes to under 1 hour walk 2 1 hour to under 2 hours walk 3 2 hours to under 3 hours walk 4 3 or more hours 5 Don't know 6	
14	How many minutes does it take to walk to the health post where people in your community generally go to get malaria treatment?	Less than 30 minutes' walk 1 30 minutes to under 1 hour walk 2 1 hour to under 2 hours walk 3 2 hours to under 3 hours walk 4 3 or more hours 5 Don't know 6	

Section 2: Knowledge about Malaria Prevention and Treatment

No.	**Questions and filters**	**Response categories**	**Skip**
15	Do you consider malaria a major health problem in this community?	Yes 1 No 2	
16	What are the main signs and symptoms of malaria? • ***Multiple responses possible*** • ***Probe for possible answers (Anything else?)***	**Yes No** Fever 1 2 Feeling cold 1 2 headache 1 2 Vomiting 1 2 Joint pain 1 2 Loss of appetite 1 2 Muscle pain 1 2 Nausea 1 2	

		Sweating 1 2 Don't know 1 2 Other (specify)_____	
17	In your opinion, what causes malaria? • ***Multiple responses possible*** ***Probe for possible answers (Anything else?)***	Mosquito bite 1 Eating immature sugarcane 2 Eating maize stalk 3 Hunger (empty stomach) 4 Exposure to cold or changing weather 5 Drinking dirty water 6 Witchcraft 7 Exposure to dirty swampy areas 8 Don't know 9 Other (specify) _____ 10	
18	For which group of the population do you think malaria is more serious? • ***Multiple responses possible*** ***Probe for possible answers (Anything else?)***	Adults ……. 1 Children under 5 years old…….. 2 Children ……. 3 Pregnant women……. 4 Elderly ……. 5 Equally serious for all……. 6 Don't know or not sure…. 7	
19	How can someone protect themselves against malaria? • ***Multiple responses possible and circle all responses that apply*** ***Probe for possible answers (Anything else?)***	Sleep under a mosquito net/ITNs……1 Avoid mosquito bites……2 Spray house with insecticide……3 Drain mosquito breeding sites around the house 4 Keep house surroundings clean…..5 Smoking (burn leaves/cow dung) in the house .6 Don't drink dirty water…..7 Don't eat bad food (immature sugarcane/leftover food)….8 Put mosquito screens on the windows….9 Eat garlic….10	

		Drink alcohol…11 Other (Specify)_____12 Don't know 13	
20	Is malaria a preventable disease?	Yes 1 No 2 Don't know or not sure 3	
21	Is malaria a treatable/curable disease?	Yes 1 No 2 Don't know or not sure 3	
22	Malaria is transmitted from one person to another by the bite of infective mosquitoes	True 1 False 2 Don't know/not sure 3	
23	It is important to seek treatment for malaria as soon as possible	True 1 False 2	
24	One can stop taking her/his malaria drugs as soon as she/he starts feeling better	True 1 False 2	
25	Indoor residual spraying is an effective means of malaria prevention and control	True 1 False 2	
26	Sleeping under a mosquito net/ITNs every night prevents malaria	True 1 False 2	
27	Does your household currently have any mosquito net/ITNs that can be used while sleeping?	Yes 1 No 2	→31
28	How many mosquito nets/ITNs does your household currently have [both used and unused]?	/_____/	
29	How frequently did you sleep under mosquito net/ITNs within the last 15 days?	All nights 1 Almost all nights 2 Sometimes 3 Only few nights 4 None of the nights 5	
30	Did you sleep under mosquito net/ITNs last night?	Yes 1 No 2	

Section 3: Knowledge about HIV/AIDS Prevention and Testing

I would now like to ask you a few questions about your chances of getting HIV/AIDS

No	Questions and filters	Response categories	Skip
31	A person can get HIV from mosquito bites.	True 1 False 2 Don't know/not sure 3	
32	It is possible for a healthy looking person to have the virus that causes AIDS.	True 1	

		False 2 Don't know/not sure 3	
33	One way to reduce chances of contracting HIV is to abstain from sex.	True 1 False 2 Don't know/not sure 3	
34	HIV can be transmitted from a mother to her baby.	True 1 False 2 Don't know/not sure 3	
35	Is there any test that a person can take to determine if he (or she) has HIV, the virus that causes AIDS?	Yes 1 No 2 Don't know/not sure 3	 **→37** **→37**
36	Where can a person get a confidential test to find out if he (or she) is infected with HIV? • ***Circle all that apply***	Gov't health center 1 Government hospital 2 Private hospital 3 Private clinic 4 Mobile VCT units 5 Don't know/not sure 6 Other (specify) _____ 7	
37	At any time in the past 12 months, have you visited a health facility for treatment of your illness?	Yes 1 No 2	 **→41**
38	If YES to Q42, have you been asked by a health worker to give a blood for HIV testing?	Yes 1 No 2	 **→41**
39	If YES to Q43, did you give your blood for HIV testing?	Yes 1 No 2	 **→41**
40	Please don't tell me the result, but did you find out the result of your test?	Yes 1 No 2	
41	Have you heard of any person in your community who was requested by a health worker in the health facility to give a blood for HIV test?	Yes 1 No 2 Don't know/not sure 3	
42	In your opinion, do you accept or reject the request of a patient by a health worker in the health facility to give blood for HIV test?	Accept 1 Reject 2	

Section 4: Concerns about HIV Testing in Delaying Malaria Diagnosis and Treatment

No	Questions and filters	Response categories	Skip
43	Is there any test that a person can take to determine if he (or she) has malaria?	Yes 1 No 2 Don't know/not sure 3	
44	Is a blood test for malaria and HIV test similar**?**	Yes 1 No 2 Don't know/not sure 3	
45	Do you think that health workers do HIV testing for people who give their blood sample for malaria testing in the health facility?	Yes 1 No 2 Don't know/not sure 3	→47 →47
46	How sure are you that you would get an HIV test if you give your blood sample for malaria testing at health facility?	Not at all sure 1 Only a little sure 2 Somewhat sure 3 Very sure 4 Completely sure 5	
47	How many people in your community believe that people who give blood sample for malaria test will also be tested for HIV?	None 1 Only few 2 Many 3 Almost all 4 All 5 Don't know/not sure 6	→49
48	Have you heard of any person in your community who did not go to health facility for malaria testing due to fear of HIV test?	Yes 1 No 2 Don't know/not sure 3	
49	Do you think that the fear of HIV testing in the health facility is the reason for people to delay from seeking early diagnosis and treatment for malaria at the health facility?	Yes 1 No 2 Don't know/not sure 3	

Section 5: Treatment Seeking Behavior for Malaria

No	**Questions and filters**	**Response categories**	**Skip**
50	How many days ago did your current illness start? • ***If less than one day, record "00"***	Days _____	
51	In your opinion, what do you think about the cause of your current illness?	_____	

52	Did you seek advice or treatment from any source before coming to this health center?	Yes 1 No 2	 →55
53	If YES to Q57, where did you seek advice or treatment? Anywhere else? • ***Record all sources mentioned***	Health post 1 Health center 2 Private clinic 3 Pharmacy/drug shop 4 Gov't/private hospital 5 Other (specify)_____6	
54	How many days after the current illness began did you first seek advice or treatment? • ***If less than one day, record "00"***	Days _____	
55	At any time during the current illness, did you take any drugs?	Yes 1 No 2 Don't know/not sure 3	 →58 →58
56	At any time during the current illness, did you take any ANTIMALARIAL DRUG?	Yes 1 No 2 Don't know/not sure 3	 →58 →58
57	If YES to Q61, what ANTIMALARIAL DRUG did you take? • **Probe (Any other drug?)*Record all responses***	CoArtem 1 Chloroquine 2 Quinine 3 Fansidar 4 Others (specify)_____ 5 I do not know 6	
58	What was the reason for coming to this health centre?	Condition becoming worse 1 Referral from other health personnel 2 To get malaria testing 3 Others (specify) _____ 4	
59	How many days after the start of your illness episode did you come to this health center? • **If the same day, record "00"**	Days _____	
60	If the duration for Q64 is >1day, what was the main reason for the delay in seeking treatment?	Thought not serious, would pass on own 1 Lack of money 2 Concerns about HIV testing 3 Health facility very far 4 Did not have time to go to the health facility 5 Other (specify) _____6	

Section 6: Laboratory Results of the Sick Person

No	Questions and filters	Response categories	Skip
61	Is blood film done for the patient to check for malaria parasites?	Yes 1 No 2	 →65
62	What diagnostic tool was used to test the blood film of the patient for malaria?	Microscopy 1 RDT 2	
63	What was the laboratory test result of the patient?	Positive 1 Negative 2	 →65
64	What was the *Plasmodium s*pecies responsible for the illness?	*P. falciparum* *1* *P. vivax* 2 Mixed of both 3 Other (specify)_____4	
65	Is any medication prescribed for the patient?	Yes 1 No 2	 →stop
66	If YES to Q70, is any ANTIMALARIAL DRUG being prescribed?	Yes 1 No 2	 →stop
67	If YES to Q71, What ANTIMALARIAL DRUG was prescribed? • ***Record all responses***	CoArtem 1 Chloroquine 2 Quinine 3 Fansidar 4 Others (specify)_____ 5 I do not know 6	

That is the end of our interview. Thank you very much for taking time to answer our questions!!

	Name	Signature	Date
Data collector	_____	_____	_____
Supervisor	_____	_____	_____

Assessment of Concerns about HIV Testing in Delaying Early Presentation And Treatment for Malaria among Adults in East Shewa Zone of Oromia Region, Ethiopia

No.	Identifications	Response
1	Questionnaire number	
2	Region	
3	Zone	
4	Woreda	
5	Kebele	
6	Name of Health Center	
7	Name of interviewer	
8	Name of supervisor	
9	Date (dd/mm/yy)	/_____/_____/2005 EC

<u>Gaaffii Calallii(ga'eessotaaf)</u>

Yeemmuu Busaa Qoratamuu fi Yaalamuuf gara Mana Yaalaa Dhuftan HIV illee nu Qoratu Jettanii Sodaattuu/Shakkittuu?

1. **Eeyyee**
2. **Lakkii**

Ibsa Kuta 1ffaa: Amalaa Siyaas-dinagdee deebii kenitoota

Lakk	Gaaffillee	Filmaata deebii ta'u malan	Irra darbi
1	Eddon bakka jirrengaa kee isaa ?(baadiyyaa/magaalaa)?	baadiyaa 1 magaala 2	
2	saala gaafatamaa	dhalaa 1 dhiraa 2	
3	Umriin kee meqaa	lekoofsan /_____/	
4	saalii bulcha abaa manaa maali?	dhiraa 1 dhelaa 2	
5	Haalii fudhaafi heruma kee maal fekaata ?	Fudhejiraa/herumejiraa 1 Hinfunee/hinherumne 2 Hikee jiraa 3 Najelaa due/dutee jirtii 4 Fudheraa garuu waliin hin jiraanu 5	
6	Amantaan kee maalii?	Musliimaa 1 Ortoodoksii 2 Katoolikaa 3 Prottestaanti 4 Kanen biraa_____ 5	
7	Sabni kee maali?	Oromoo 1 Amaara 2 Guragee 3 Kambaataa 4 Hadiyaa 5 Tigree 6 Kanan biraa _____ 7	
8	Sadarkaan berumsa kee hammami?	Dubisuuf barresu hin danda'uu 1 Dubiisuf barresu qofaa 2 Sadarkaa 1ffaa (1-4) 3 sadarkaa saaykilii2ffaa (5-8) 4 sadarkaa 2ffaa (9-12) 5 BLTO(10+1 or 10+2) 6 BLTO(10+3 /Diploma 7 Digree tookofaa fi olli 8 Kanan birra _____ 9	
9	Hojin kee kan ammaa maali? *Isaa tokko qofa filadhu*	Qotebula 1 Hadhaa manaa 2 Hojeta/tu guyyaa 3 Hojettaa/tu motummaa 4 Hojettaa/tu miti motummaa 5 daldalaa 6 baraata 7 kan birraa_____ 8	
10	Mana keesaan: Ibsaan ni jira? Rediyoon ni hojetaa?	<u>Eyyee</u> <u>miti</u> ibsa..... 1 2 Rediyoon ni hojetaa..... 1 2	

	Televina qabdu/ni hojeta? Bilbila mana qabdu? Firijiin ni jira/hojeta?	Televina qabdu/ni hojeta 1 2 Bilbila mana qabdu..... 1 2 Firijiin ni jira/hojeta 1 2 Biskileetti 1 2	
11	Qoxxiin ykn xarraan mana keessaanni maliin kan ufifamee?	cittaa .....1 qorqorroo.....2 kan birraa_____ 3	
12	Tajaajilii fayyaa nannoo kessanitti dhihoo jiru kami?	Kellaa fayyaa 1 Bufattaa fayyaa 2 Hospitaala dhunfaa/ummata 3 kilinikaa 4 hin beekamu 5 kan birraa_____ 6	
13	Bufanni fayyaa iddoo jireenyaa kessaan irraa hamam fagaata?	Sa'attii walakaa gaddii demsisaa (daqiqa 30) 1 Walakaa sa'attiti hanga sa'aa tokkoodemsiisa 2 Sa'aa tokko hangaa lammaa demsiisa 3 Sa'aa lammaa hanga sadii demsiisa 4 Sa'aa sadiif sadii ol 5 Hin beekamu 6	
14	Kellaan fayyaa iddoo jireenyaa keessan irraa yaali busaa argatuf daqiqaa hamaam fudhatta?	Daqiqaa 30 gadii 1 Daqiiqaa 30 hangaa sa'aa tokkoo 2 Sa'attii tokkoo hangaa lammaa 3 Sa'attii lammaa hangaa sadii 4 Sa'attii sadiif sadii ol 5 Hin beekamu 6	

kutaa 2ffaa: Beekumsa ittissa dhibbee busaa fi yaalitti issaa

Lakk	**Gaafille**	Filmaata deebii ta'u malan	**Irra darbi**
15	Dhukkuba BUSAA akka rakko cimaa ummatatti ni lakkoftaa?	eyyee 1 lakki 2	
16	Mallattoon dhibee busaa maalii **(deebin tooko ol ni dende'ama)**	hoo'aa nafaa 1 hollachiisuu 2 bowwoo 3 ha'aa 4 Dhukubii walqunnamtii lafee 5 Ngaata jibisisu 6 Dhukubii irree 7 Lolojjii 8 dafqiisisu 9 (kannen biraa)_____10	

		Ani hin bekuu 11	
17	Akka yaada keessaniitti busaa maaltu fidaa?	Ciininaa bookee busaatin 1 Ciininaa bookee busaatin erga nama busaan qabee ciininee 2 Tutuqaa Qaamaa nama busaan dhibemeen 3 Haafuraan 4 Kan biraa yoojiraate ibsii)_____ 5 Ani hin beeku 6	
18	Dhukkubni **BUSAA** kan caalatti hammaatu garee namoota kamiitti? • ***Deebiin hedduun ni danda'ama*** • ***Deebii sirriitiif haalaan kakaasi (Kan biros yoo jiraate?)***	Ga'eessota ……. 1 Daa'mman wagaa 5 gadii ……. 2 Ijoolleerratti ……. 3 Dubartii ulfaa……. 4 Jaarsolii ……. 5 Hundaafuu qixa hamaa dha……. 6 Agoobara busaa jala rafuu……7 Hin beeku ykn ni shakka….. . 8	
19	Namni tokko akkamitti busaa ufi irraa ittisaa? • ***Deebiin hedduun ni danda'ama, kan sirri irra mari*** • ***Deebii sirritif sirritti kakaasi (Kan biros yoo jiraate?)***	Agoobara busa jala rafuu/ITNs……1 Iddiinsa bookee busaa hanbisu……2 Farra ilbiisotaa biifuu……3 Naannoo mana jireenyaatti bishaan ciisaa dhoorkuu 4 Naannawa manaa quliqulina eegu…..5 Naannawa manaatti aara aarsuu(baala/kosii) .6 Bishaan balfaa dhuguu dhiisuu…..7 Nyaata badaa nyaachuu dhabuu(shonkoora hin gahin/haftee) 8 Calaltuu busaa fooddaarra kaahu….9 Garlika nyaachuu….10 Alkoolii dhuguu…11 Kan biro(ibsi)_____12 Hin bekuu 13	
20	Dhukkubni busaa dhibee ittisuun danda'amuu dha?	Eeyee 1 Lakki 2 Hin beeku ykn shakkii qaba 3	
21	Dhukkubni busaa dhibee yaaluun/fayyuun danda'amuu dhaa?	Eeyee 1 Lakki 2 Hin beeku ykn shakkii qaba 3	

22	Dhukkubni BUSAA nama tokko irraa kan birootti kan darbuun hiddiinsa bookee busaa dhibeen qabamteen	Dhugaa 1 Soba 2 Hin beeku ykn shakkii qaba 3	
23	Dhukkuba Busaa tiif hatattamaan yaala barbaachuun bu'aa qabaa	Dhugaa 1 Soba 2	
24	Namni tokko akkuma itti fooyya'een dawaa dhukkuba busaa fudhachuu dhiisuu ni danda'a	Dhugaa 1 Soba 2	
25	Keemikaalli mana keessatti biifamu busaa ittisudhaaf mala bu'a qabeessa	Dhugaa 1 Soba 2	
26	Agoobara bookee busaa/ITN jala rafuun busaa ittisudhaaf mala bu'a qabeessa	Dhugaa 1 Soba 2	
27	Manni jireenyaa keessan yeroo ammaa kana agoobara bookee busaa/ITN yoo keessa rafan ittisu qabaa?	Eeyyee 1 lakki 2	
28	Agoobara bookee busaa meeqa manaa qabduu(kan fayyadamee fi hinfadamin illee)	/_____/	
29	Torbee lamaan darban keessatti agoobara bookee busaa jala hangam bultan?	Halkan hundaa 1 Guutumatti halkan hundaa 2 Darbee darbee 3 Hankan xiqoo qofa 4 Homaayyuu jala hin bulle 5	
30	Halkan darbe agoobara bookee busaa jala bultanii?	Eeyyee 1 lakki 2	

kutaa 3ffaa: Beekumsaa ittisa HIV /AIDS fi qorannoo

Lak	**Gaafillee**	Filmaata deebii ta'u malan	**Irra darbi**
31	Iddiinsa bookee busaatirraa namni tokko HIV qabamuu ni danda'a	Dhugaa 1 Soba 2 Hin beeku ykn shakkii qaba 3	
32	Namni fayya qabeessa fakkatu HIV, vayrasii dhibee AIDS fiduu, qabaachu ni danda'aa?	Dhugaa 1 Soba 2 Hin beeku ykn shakkii qaba 3	
33	Karaan dhukkuba HIVtiin qabamuu ufirraa ittisaniin tokko walqunnamtii saalaa irraa fagaachuudha	Dhugaa 1 Soba 2 Hin beeku ykn r shakkii qaba 3	
34	HIVn haadha irraa gara daa'imaa darbuu ni danda'a	Dhugaa 1	

		Soba 2 Hin beeku ykn shakkii qaba 3	
35	Qorannoon namni tokko HIV, vayrasi AIDS fidu, qabaachuu fi dhabuu isaa/ishee baruuf taasisu jiraa?	Dhugaa 1 Soba 2 Hin beeku ykn shakkii qaba 3	**→45** **→45**
36	HIV qabaachu isaa/ishee baruuf Iddoon namni tokko qorannoo icciitii itti argachuu danda'u eessa? • **Kan sirrii ta'u hundaa irra mari**	Buufata fayyaa mootummaa 1 Hospitaala mootummaa 2 Hospitaala dhuunfaa 3 Kilinika dhuunfaa 4 Yuunitii VCT sosso'aa 5 Hin beeku ykn shakkii qaba 6 Kan biro(ibsi) _____7	
37	Ji'oota 12n darban kamiin keessattu, dhibee isin qabeef mana yaalaa dhaqxee beektaa?	Eeyyee 1 Lakki 2	
38	Gaaffii 37 deebiin kee eeyyee yoo ta'e, qoranno dhiigaa HIV tiif ogeessota fayyaatiin gaafatamtee beektaa?	Eeyyee 1 Lakki 2	
39	Yoo gaaffii 38 fi eeyyee jette, qorannoo HIV tiif dhiiga kennitee?	Eeyyee 1 Lakki 2	
40	Maaloo natti hin himiniitii, garuu bu'aa qorannoo keetii argitee?	Eeyyee 1 Lakki 2	
41	Hawaasa keessaatti nama kamiifuu qorannoo dhiigaa HIV ogeessota fayyaatiin ajajamuu isaa dhagesse jirtaa?	Eeyyee 1 Lakki 2	
42	Akka yaadaa keessaniitti, ajajajiinsa qorannoo dhiigaa HIV dhibamaaf ogeessota fayyaatiin godhamu ni fudhattu moo ni dhiistu?	Nan fudhadha 1 Hin fudhadhu 2 Hin beeku ykn shakkii qaba 3	

Kutaa 4: Beekumsa akkaataa ittisaa fi barbaachisummaa yaalii dhukkuba busaa

Lak	**Gaafille**	Filmaata deebii ta'u malan	Irra darbi
43	Busaa qabaachuuf dhiisuu isaa (ykn ishee) baruuf qorannoon namni tokko raawwatu jiraa?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	
44	Qorannoon dhiigaa kan BUSAA fi HIV walfakkaataa?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	
45	Akka ilaalcha keessaniitti qorannoon HIV nama busaa laallamuuf dhiiga kenne hundaafu mana yaalaa keessatti ni hojjatamaa?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	

46	Dhiiga busaa laallamuuf laatte iraa qorannoon HIV sirratti raawatamuu isaa hangam itti amantaa?	Guutumatti itti hin amanu 1 bicuu isheen amana 2 Hanga tokko ni amana 3 Baay'ee itti amana 4 Guutumatti itti amana 5 Hin beeku /shakki qaba 6	
47	Ummata keessatti namoota hangamtu dhiigni busaa qoratuuf fudhatamu HIV illee qorachuuf tajaajila jedheet amanaa?	Homaa 1 Xinnoo 2 Baay'ee 3 Irraa caalaan 4 Hundinuu 5 Hin beeku /shakki qaba 6	
48	Ummata keessatti namootni soda qorannoo dhiigaa HIV tiif jechaa busaa yaalamuuf gara mana yaalaa dhufuu dhiisan dhageessee jirtaa?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	
49	Sodaan qorannoo HIV mana yaalaa keessaa, duubatti harkifachuu yeroon qoratamuu fi yaalamuu dhibee busaatiif sababa ta'a jettanii ni yaadduu?	Eeyyee 1 Lakki 2 Hin beeku 3	→51

Kutta 5: haala barbaacha yaalaa dhukkuba busaa

Lakk	**Gaafille**	Filmaata deebii ta'u malan	Irra darbi
50	**Dhibeen ammaa kun hanga si calqabe guyyaa meeqaa** ***Yoo guyyaa 1 gadi ta'ee, "00" guuti.***	Guyyaa_____	
51	Akka ilaalcha keessaniitti dhukkuba amma maaltu fida jettee yaadda? ***Deebii tokko qofa***	_____	
52	Otoo gara mana yaalaa kana hin dhufne dura iddoo biraa irraa gorsa ykn yaala barbaaddee turtee?	Eeyyee 1 Lakki 2	→ **55**
53	Yoo deebiin gaaffii 52 eeyyee ta'e, iddoo kamitti gorsa ykn yaala barbaadduu? • ***Iddoo kamiyyuu iddoo ibsamee hundaa barreessi***	Kellaa fayyaa 1 Buufata fayyaa 2 Kilinia dhuunfaa 3 Faarmaasii/duunkaana qorichaa 4 Hospitaala mootummaa/dhuunfaa 5 Kan biroo (ibsi) _____6	

54	Ergaa dhukkubni kun isin eegale guyyaa meeqa booda yeroo duraatiif gorsaa ykn yaala barbaaddan? ***Yoo guyyaa tokko gadi ta'ee, "00" guuti***.	Guyyaa_____	
55	Yeroo dhukkubsate kamittuu, **qorcha woyii** fudhattee beekta?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	 **→58** **→58**
56	Yeroo dhukkubsatte kamittuu, ***qorcha dhukkuba busaa*** fudhattee beekta?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	 **→58** **→58**
57	Yoo G 56 eeyyee jette Qoricha busa isa kam da'ima dhibamuuf laattan	CoArtam 1 Chloroquine 2 Quinine 3 Fansidar 4 Hin beeku 5 Kan biro(ibsi) _____ 6	
58	Dhimmii cimaan gara mana yaala kana isin fide maal?	Haalli itti cimaa dhufuusaa 1 Ogeessa fayyaa biraatiin ergameeti 2 Busaa dhiiga qoratamuuf 3 Kan biro(ibsi) _____4	
59	Ergaa dhibeen kun isin eegale guyyaa meeqa booda gara mana yaala kana dhuftan? ***Yoo guyyaaa tokko gadi ta'ee, "00" guuti.***	Guyyoota_____	
60	Yoo deebiin gaaffii 59 ffaa guyya **1** ol ta'e, dhimmi cimaan akka turamu taasise maal?	Dhibeen hamaa ta'uu dhiisuu 1 Hanqina qarshii 2 Shakkii qorannoo HIV 3 Mannii yaalaa dhihotti dhabamu 4 Yeroo gahaa dhabuu 5 Kan biro(ibsi)_____ 6	

Kutaa 6ffaa: Bu,aa Laaboraatory nama dhukkubsatuu.

Lak	**Gaafille**	Filmaata deebii ta'u malan	**Irra darbi**
61	Fiilmiin dhiigaa (blood film) maxxantuu busaa qoratuuf nama dhibamu irraa fudhatamee.	Eeyyee 1 Lakki 2	**→65**
62	Qorannoon dhiigaa nama dhibamuuf diagnostic teestii maal fayyadamun taasifamer?	Maaykiroskopii 1 RDT 2	
63	Bu'aan laboratoorii nama dhibamuu maal?	Posatiiva 1 Negatiiva 2	**→65**
64	Sanyiin pilaasmoodiyeem dhukkuba fidee kami?	P. falsiiparum 1 P. vivax 2 Makaa lamaanii 3 Kan biroo (ibsi)_____ 4	
65	Nama dhibamuuf dawaan kamiyyuu ogeessota fayyaatiin mana yaalatti ajajamuu qaba turee?	Eeyyee 1 Lakki 2	**→STOP**
66	Nama dhibamuuf dawaan FARRA BUSAA kamiyyuu ajajamuu qaba turee?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	**→STOP** **→STOP**
67	Qorichi FARRA BUSAA namni dhibamu fudhatu qabaatu isa kami? deebii hundaa galmeessi	CoArtemii 1 Kilorooqinii/Chloroquine 2 Quinini 3 Fansidar 4 Hin beeku 5 Kan biroo (ibsi) _____ 6	

Kun xumura gaaffii keenyaati. Yeeroo fudhattanii deebii nuu laattuu keessaniif baay'ee galatoomaa

	Name	Signature	Date
Data collector	_____	_____	_____
Supervisor	_____	_____	_____

ID---------- Age----------Sex----------Occupation----------Religion----------
---------- Marital status----------Educational level----------

GUIDE LINE FOR INDEPTH INTERVIEW

1) Do you think that the community has knowledge on the prevention and treatment of malaria?
2) What about the community's knowledge on HIV/AIDS prevention and testing?
3) What is your opinion with regards to the community's perception towards HIV testing?
4) What is your view on the treatment seeking behavior of the community towards malaria? And what are the factors associated with delay in treatment seeking?
5) Do you think that people in your community believe that people who give blood sample for malaria test will also be tested for HIV?
6) Do you think this concern has a role in delaying early presentation and treatment of malaria in the community?
7) Finally if there is anything left in your mind unsaid the floor is open?

THANK YOU!

GUIDELINE FOR FGD

1. Discuss on malaria?
   A. What do you know about malaria testing, transmission and treatment?
   B. How do you perceive malaria? (regarding it severity)
   C. How do you prevent malaria?
2. Discuss on HIV/AIDS testing?
   A. What do you know about HIV testing?
   B. Discuss about your perception towards HIV testing?
3. Discuss on the treatment seeking behavior of patients with malaria?
   A. What do you do if you started to have symptoms of malaria?
   B. What are the factors associated with the delay in treatment seeking for malaria?
4. Do think that people who give blood sample for malaria test will also be tested for HIV? If so does it has a role in delaying early presentation and treatment of malaria?
5. Finally if there is anything left in your mind unsaid the floor is open?

THANK YOU!

Participant No.	Age	Sex	Marital status	Religion	Occupation	Education	Grade
P1							
P2							
P3							
P4							
P5							
P6							
P7							
P8							

Annex 2: Consent Form

My name is _____. I am working here in _____ Health Centre as a laboratory technician/nurse. I would like to inform you that you and I would have a short discussion concerning this study. Before we go to our discussion, I will request you to listen carefully to what I am going to read to you about the purpose and general condition of the study and tell me whether you agree or disagree to participate in this study.

I. Informed consent agreement

The purpose of this study is to assess concerns about HIV Testing in delaying early presentation and treatment of malaria among adults in East Shewa Zone of Oromia Region. The study will be conducted through interviews. I am asking you for a little of your time, about 25 - 35 minutes, to help us in this study. In the end, it is hoped that the information you give us could help to design appropriate strategies of reducing deaths and illnesses from malaria in this country. The interview involves intimate and private life questions. I would like to assure you that this privacy should strictly be maintained throughout. A code number will identify every participant and no name will be used. Your responses to any of the questions will not be given to anyone else and no reports of the study will ever identify you. If a report of results is published, only information about the total group will appear.

The interview is voluntary. Your participation / non-participation, or refusal to respond to the questions will have no effect now or in the future on services that you or any member of your family may receive from any service providers. However, we hope that you will participate in this survey since your views are important.

Are you willing to participate in this study?

1. [ ] Yes. 2. [ ] No

Thank you!!

If the study subject agrees to participate in the study, start the interview.

Interviewer signature certifying that informed consent has been given verbally by the respondent.

Name _____ Signature _____Date _____.

NB:

1. No need of enforcing the patients to be included in the study.

2. Please register the age and sex of study subjects who refuse to participate in the study.

If you need further information about the study please contact the following person:

FREW TADESSE (B.Sc.)

seenssaa

I. Dhunkkaa Oddeefanno dhunfaa

Maqaan kiyyaa _____dha.kannen hojjedhu assi Buffata Fayyaa _____ jedhamu kessati oggummaan kiyyaa labraatory/narsiitin yoo ta,u Osoo mare qorannoo kana ilaalatutti hin seenin dura haala fi faayidaa qorannoo kanaa yemmuun isiniif dubbisu qalbii dhaan akka nadhaggeeffatan kabajaan isin gaafadha sanaan bodaa qorannoo kana kessatti hirmaachuf fedhii qabaachu kessan akka nuf ibsitan kabjaan issin gaafadha.

II. Walligelttee qoranno irrati hirmaachu

faayidaan qorannoo kanaa dhibaan soodaa qoranno HIV yaalittti fi dafaniyaaliti barbaadu dhisu u dhukuba busaa ga'eesota irreti fidu Godinaa Shawaa bahaa Naanno Oromiyaa Ettiyoophiyaa illala. Kana waan ta'eef yeroo murta'ee waliin wajjin fudhannee (yoo baa'yatee daqiiqaa 25-35) qorannoo kana irratti akka hirmaatan kabajaan isin gaafanna. Yaadin isin nuuf latan haala ykn tajaajila fayyaa du aa fi dhibamu dhukubaa bussa guutuu biyyaatti argamu foyyeesuuf bu'uura ta'a jennee amana. Haa ta'u iyyuu malee maqaa fi deebiin isin gaaffiilee keenyaaf lattan hundumtuu icittii dhaan egamu waan ta'eef yaadda'uun isin irraa hin jiru. Raawwiin qorannoo kana yoo ni maxanfama illee ta'e maqaa nama tokkon osoo hin tane yaada hirmaatoota hudaa waliti qabu dhaan ta'a. Qorannoo kana irratti hirmaachuun fedhii irraatti kan hunda'ee yeroo ta'u hirmaachuus ta'e hirmaachuu dhisuun tajaajila isiniis ta'e maatiin keessan gara fula duraatti dhabbilee adda addaa irraa argatan irratti dhiibbaa hin qabu. Qoranno kanna irratti ni hirmadha

1. [ ] eyyeen. 2. [ ] laki

Galletoomaa!!

Yoo dhukubsataan fedhii hirmaachu qabaate gaafachu egalli

HB:

1. Dirqqisisani akka hirmaatu godhun goongumaa hin barbaachisu
2. Warra hirmaachu didan umrii fi saala isaani katabii
3. qoranno kan irrati odeefanno yo barbaaden maqaan isaani kan armaan gadii caqafamee qunamuu ni dandessuu.

Declaration of Principal investigator

I the under signed MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health. All the source of materials used for this thesis and all people and institutions who gave support for this work is fully acknowledged.

Name: Frew Tadesse

Signature _____

Place of Submission: School of Public Health, Faculty of Medicine, Addis Ababa University

Approval of the primary Advisor

This Thesis work has been submitted for examination with my approval as university advisor.

Advisor's Name: Dr. Wakgari Deressa(Associate professor)

Signature _____