

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES



DETERMINANTS OF HIV TESTING AMONG
TUBERCULOSIS PATIENTS ON DOTS IN EAST WOLLEGA
ZONE, ETHIOPIA

By: Gebi Agero Genemo (BSc)

A thesis submitted to the School of Graduates studies of Addis Ababa University in partial fulfillment of the requirements for the degree of Masters of Public Health in Epidemiology

April, 2011 G.C

Addis Ababa, Ethiopia.

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF PUBLIC HEALTH**

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Advisor: Alemayehu Worku (BSc, MSc, PhD)

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**DETERMINANTAS OF HIV TESTING AMONG TUBERCULOSIS
PATIENTS ON DOTS IN EAST WOLLEGA ZONE, ETHIOPIA**

A case control study

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Dedication

I dedicate this work to my beloved mother Shashu Uke Bariso one who sent me early to school, give me courage, love and help me for the accomplishment of my objectives and my daughter Sintolina who gave me a chance to see how a family cares for his child.

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Acronyms and Abbreviations

AAU	Addis Ababa University
AIDS	Acquired Immuno Deficiency Syndrome
ANC	Antenatal care
DOTS	Directly Observed Treatment Short-course
EPTB	Extra Pulmonary Tuberculosis
ETB	Ethiopian Birr
FMoH	Federal Ministry of Health
HAART	Highly Active Anti Retroviral Therapy
HIV	Human Immunodeficiency Virus
MDR	Multi Drug Resistant
OR	Odds Ratio
PIHCT	Provider Initiated HIV Counseling and Testing
PITC	Provider Initiated Testing and Counseling
PLWHA	People Living With HIV AIDS
PTB	Pulmonary Tuberculosis
PYO	Person Years of Observation
RR	Relative Risk
SSA	Sub-Sahara Africa
TB	Tuberculosis
VCT	Voluntary Counseling and Testing
WHO	World Health Organization
XDR-TB	Extremely Drug Resistant Tuberculosis

Abstract

Background: Tuberculosis is the most common cause of death among people living with Human Immunodeficiency Virus. The World Health Organization recommends that in countries where HIV prevalence is at least 1% among adults and 5% among Tuberculosis patients, all Tuberculosis patients should be offered HIV testing and all People living with HIV should be screened for Tuberculosis. To increase uptake of HIV testing, it also recommends provider initiated HIV testing and counseling.

Objectives: The objective of this study was to assess determinants of HIV testing among Tuberculosis patients on DOTS in East Wollega zone, Ethiopia.

Methodology: Institution based case control study design was conducted from January – March 2011. Both quantitative and qualitative approaches were used. Cases were tuberculosis patients who have not accepted HIV testing while the controls were those who have accepted HIV testing. A sample of 270 (90 cases and 180 controls) tuberculosis patients, with a ratio of two controls to one case, was used. Simple random sampling technique was used to recruit study subjects and SPSS Version 17 was used for quantitative analysis while verbatim was used for qualitative data.

Result: Tuberculosis patients who have tested for HIV have heard their HIV test result in which 23(12.8%) of them were HIV positive and 157(87.2%) of them were HIV negative. The proportion of HIV infected individual was 10(13.2%) among males and 13(12.5%) among females, while its 19(16.4%) among TB patients from urban and 4(6.2%) among those from rural area. Tuberculosis patients having low knowledge about HIV were more likely to reject HIV testing AOR 3.697 (CI 2.135, 6.402) compared to those who are knowledgeable about HIV. Higher level of stigmatized attitude toward HIV and being from urban were also associated with rejecting HIV testing AOR 3.421(CI 1.870, 6.257) and AOR 5.692(CI 1.930, 16.783) respectively.

Conclusion: Efforts to promote HIV testing utilization require effective strategies to reduce stigmatizing beliefs towards HIV and PLWHA among TB patients. Health information dissemination regarding HIV testing and risky sexual behavior reduction should have to be targeted most at risk population like tuberculosis patients.

1. Introduction

1.1 Background

Tuberculosis (TB) is the most common cause of death among people living with HIV/AIDS (PLWHA). The World Health Organization (WHO) recommends that in countries where HIV prevalence is at least 1% among adults and 5% among TB patients, all TB patients should be offered HIV testing and all PLWHA should be screened for TB and to increase uptake of HIV testing, WHO also recommends provider-initiated HIV testing and counseling (PITC) (1).

HIV related Tuberculosis remains serious challenge for health sector response to HIV. All countries with a generalized HIV epidemic state should aim to ensure that HIV testing is actively promoted and offered to all TB patients. The data available from these initiatives can form the basis of a reliable surveillance system that achieves high coverage (>80%) of testing among TB patients(1).

Recent data show that, of the 9.27 million incident TB cases worldwide in 2007, an estimated 1.37 million were among people living with HIV. About 456 000 people living with HIV died from TB in 2007, 23% of the estimated 2 million HIV-related deaths in that year and the risk for acquiring TB is 20 to 37 times greater among people living with HIV than in the general population, depending on the prevalence of HIV in the population. In some countries in sub-Saharan Africa, up to 80% of people with TB are also living with HIV(2, 3).

Thus, the high rate of HIV infection and poorly functioning tuberculosis control programs in many parts of Africa are likely to contribute to the emergence of extreme drug resistant (XDR) tuberculosis, which could destabilize the control of tuberculosis in these areas (4).

Sub-Saharan Africa continues to account for the majority of people living with HIV and TB in the world. In 2007, about 79% of the estimated total people living with HIV and TB were in this region posing other burden like risk of drug resistant forms of TB due to difficulty and delays in diagnosis, increased mortality and greatly reduced survival time(2).

Tuberculosis (TB) is the initial clinical manifestation of human immunodeficiency virus (HIV) disease for many people in sub-Saharan Africa, and a very high proportion of TB patients in this region are co-infected with HIV. HIV counseling and testing of TB patients is therefore an important method for

identifying HIV-infected individuals, all of whom require HIV care and many of whom are indicated for antiretroviral therapy (5).

Smear-negative pulmonary tuberculosis (PTB-) was identified to be the most common type, 54%, followed by smear-positive pulmonary tuberculosis (PTB+); 20%, while extra pulmonary tuberculosis (EPTB); accounts 16%. Incidence rate of tuberculosis was 10 cases/101.3 PYO = 9.9 cases per 100 PYO (95% CI, 8.112.0) where the rate was higher in patients with stage III and IV disease (8/70.5 PYO = 11.4 per 100 PYO) than stage I and II combined (2/30.9 PYO = 6.5 per 100 PYO however there is no significant difference (6).

A test done among TB suspects revealed a 42% HIV seropositive of these, 37% received a non-TB diagnosis. Patients who received a non-TB diagnosis were significantly more likely to be HIV-seropositive than those who were diagnosed with TB (49% vs. 39%; odds ratio [OR] 1.6, 95% confidence interval (1.1–2.2, $P = 0.02$) (7).

Integrated TB and HIV treatment was described as ‘easy.’ The ‘ease’ was in part related to the introduction of HAART with the less stigmatized TB treatment, where TB is perceived to receive less ‘looking’ than HIV (8).

WHO estimates that in Ethiopia 40% of TB patients tested for HIV are HIV positive, (2). While a study done in Arbaminch demonstrated that the prevalence of HIV among tuberculosis patients was high among individuals from urban areas and TB-HIV co-infection was high among women’s (32.3% versus 10.8% among men) and there is no significant difference between urban and rural in TB-HIV co-infection, but study done in Cameroon demonstrated a 68.5% HIV seropositive prevalence among TB patients (9, 10).

1.2 Statement of the problem

Proportion of population group most at risk who receive HIV counseling and testing in the past 12 month was low. Socio-economic factors, educational level, residence and house hold wealth are associated with accessing the service(2).

HIV sero prevalence of 17.7% among pregnant women in Burkinafaso, suggests that women who take up VCT represent a selected and motivated population who feels at risk, despite the fact that personal risk was perceived to be low. These apparently discordant findings may be partly because of the social stigma that closely links HIV infection with reprehensible sexual behavior that puts only bad persons at risk (9, 11).

Factors like individuals self perceived risk of HIV infection were associated with initial willingness but are not associated with actually accepting the result, concerns about confidentiality, convenient timing of the service, level of spoken English and place of the testing site have been described as determinants of acceptability of HIV testing services (11-15).

Operational factors like not understanding the process during group education session/pre test counseling, disagreement of the partner, wanting the partner to be tasted before hand, having salesman partner and the perception that the community would have negative attitude are explained as determinant factor for participation in HIV counseling and tasting. Distance to HIV testing site (presence of onsite HIV tasting) was associated with client's uptake of HIV testing among TB patients (11, 16, 17).

To realize the right to health, States need to identify groups at risk of HIV in order to develop effective HIV prevention and control programs(18). VCT services may provide a means for States to fulfill the right to health as a way to prevent HIV and as the gateway for people with HIV to access health care. However, States must ensure that VCT is accessible and acceptable to the whole population at risk of HIV (17, 18).

Poor autonomy in the female population, requiring male consent to accept the VCT proposal, social stigma of HIV/AIDS infection and fear of not having access to effective treatment were identified as a predictive factors for not accepting VCT services (11).

In spite of high rate of initial willingness, only small portion of TB patients were tasted 35% compared to 18.7% among pregnant women attending ANC in Burkinafaso (9, 11), low acceptability of HIV counseling and tasting among TB patients pose great challenge in scaling up TB-HIV collaborative effort and high lights the need for identifying and removing the underlying causes(9).

Testing practices are highly dependent on the local culture of the clinics and the individual practices of healthcare workers (15).

So this study was aimed to investigate, determinants for HIV testing among tuberculosis patients that halt HIV testing, the way to strengthen and scale up TB-HIV collaborative activity and provide the way to achieve 80% HIV testing among tuberculosis patients as a millennium development goal in the country and particularly in East Wollega zone, Ethiopia.

The findings of this study have an immense contribution to policy makers and planners; in designing and solving constraints that made uptake of HIV testing among tuberculosis patients to be low, organizations and stake holders that work on programs regarding TB-HIV prevention and control and specifically the local study population and the corresponding local managers in designing intervention program to avert these factors.

2. Literature review

2.1 Tuberculosis and HIV co-infection

Among 5299 registered TB patients in India the overall prevalence of HIV infection was 468 (8.8%) which includes 268 (5.1%) who were known HIV-positive prior to TB diagnosis, and an additional 200 (3.8%) detected after TB diagnosis. Male TB patients were more likely to be HIV-infected than females (9.9% vs. 6.8%, relative risk [RR] 1.5, 95% confidence interval [CI] 1.2–1.8). Although HIV infection was detected in all age groups, HIV seroprevalence was highest in the 35–44 year age group both among males (19.7%) and females (13.5%) (19).

Study done in Vietnam shows in 2002, 1 in 10 TB patients were HIV infected, and 1 in 5 men (11.6% among men and 2.2% among females) <35 years of age were HIV infected, the seroprevalence of HIV was 19.9% in <24 years age, 14.4% 25-34 age and 3.6% among 35-44 years age group (20).

Individuals aged ≥ 20 years who were unaware of their HIV status at the time of TB diagnosis, 72.9% (603/827) of patients accepted HIV testing if offered. The prevalence of HIV among those previously unaware of their HIV status who accepted an HIV test was 14.3% (86/603). In assessing timing of HIV diagnosis in relation to TB diagnosis, approximately half (99/193, 51.3%) of patients co-infected with HIV/TB had been tested previously for HIV and were aware of their HIV status at the time of the TB diagnosis; 42% (81/193) were tested and diagnosed with HIV at the time of their TB diagnosis; and the remaining 16.7% (13/193) patients had an unknown time of HIV diagnosis in relation to their TB diagnosis (15).

An ecological study, in Oromia region demonstrated a positive association between the incidence of TB and prevalence of HIV infection, suggesting that the prevalence of HIV infection is associated with up to 47% of the variance in tuberculosis infection at the regional level and other study from southern region of the country show that up to 18% of TB patients are co-infected with HIV (21, 22).

2.2 Knowledge, attitude and stigma related to HIV testing

Eighteen percent of participants thought that individual being tested must have been engaged in ‘dirty’ behavior when seeing someone being tested for HIV, while 13.2% thought the person being tested must have AIDS and the difference was more significant among rural than urban participants, and negative attitudes were closely related to low education levels (23).

Voluntary counseling and testing was mentioned as the only sure way of “proving” that one is actually infected with HIV (24).

The top three reasons why a participant would not be willing to be tested for HIV were: ‘no risky behaviors’ 86.5%, ‘do not have time’ 9.8%, and ‘afraid of being seen by friends’ 7.5% (23).

Worried about risky sexual behavior 47%, marriage 21%, death of sexual partner 16%, and others 8% (blood donation, getting scholarship and joining army) were described as the reasons for undertaking VCT (24).

Study done in china indicates that the level of knowledge among rural participants was lower and VCT-related knowledge was closely related to education level, 213 participants (23.1%) thought there was no benefit of being tested for HIV or did not know the benefits of being tested, while 308 participants (27.1%) thought that there was no negative effect from being tested for HIV (23).

Fears of AIDS stigma place at the centre of the challenges faced with disclosing HIV status that centered on two broad issues: like expectations of support from family, friends and personal preparedness (8).

There were marked contrasts in factors associated with readiness between the younger age group (15–24) and older (25–49) people. Poor self-rated health was positively associated with willingness only in age group 25–49 years (two times higher likelihood of being willing among those with poor/fair self-rated health vs. good/excellent health). In contrast, the main factor associated with readiness in the younger age group was self-perceived risk of being HIV infected (no vs. high risk: OR, 1.9; 95% CI, 1.23–2.90). Being tested for HIV in the past also appeared as an independent factor positively influencing readiness in the older age group (25).

An estimate of risk of being infected with HIV in the coming one year where 23% of the respondents said they had no chance of being infected, 40% said their chance is either very small or small, 30% said their chance is either big or very big, 4% said they are already infected, while 2% said they could not access the risk (24).

2.3 Barriers to HIV testing

A study done in china shows 372(37.8%) participants did not know where to ask questions about AIDS, and 338 participants (34.2%) did not know where to get an HIV test in which VCT-related knowledge was closely related to education level, further more a total of 213 (23.1%) participants thought there was no benefit to being tested for HIV or did not know the benefits of being tested (23).

Acceptance of counseling and willingness to be tested were related to education level; the higher the education level, the higher the acceptance proportion, in which only 43.5% would be willing to be tested, among 56.2% of all participants that would ask questions related to HIV (23) .

Reasons why a participant would not ask questions relating to HIV were: ‘Not necessary, because not at risk’ (78.9%), ‘afraid of being infected’ (9.6%), and ‘not necessary, because know enough’ (8.1%) (23).

Believing no risky behaviors 62.4%, afraid of being seen by friends 22.5% people might think I have AIDS 21.0%, afraid that health personnel would not keep the test result confidential 15.1%, and fear of discrimination if positive 13.1% were identified as a barriers for testing in china (23).

Reasons for visiting the VCT site or getting tested were having the coupons 72.9% and ‘being in the research study’ 35.6%. Factors like no risk behaviors 84.9%, do not have time 14.2%, and afraid of needles 8.2% were mentioned as a reason for not testing (23).

Low ART acceptance among TB patients in a rural district of Malawi identifies the cost of transport to the centralized hospital based ART site. The higher the cost of transport to the hospital based ART delivery site, the less probable it is that a TB patient accepts ART (26).

Current illness in about 23% of individuals was associated with accessing VCT services in Malawi (27). Failure to test for HIV was independently associated with an age greater than 60 years, female gender; outpatient location at diagnosis. One reason for a failure to test for HIV could be that physicians do not initiate HIV testing in patients whom they perceive to be at a low risk for HIV infection even though 1.3% of females, perceived to be at “low risk”, were found to be seropositive for HIV (28).

Among the social influences that influence individuals up take of VCT, myself 72.3%, 85.2%, sexual partner 47.6%, 45.3%, health workers 15.9%, 21.9% and relatives 12.2%, 7.3% were mentioned among females and males respectively (24).

One hundred and sixty nine (38%) patients had to make more than two visits to the integrated counseling and testing center (ICTC) to complete testing and among those patients tested, 52% of the patients reported that they had not undergone pre-test counseling (29).

A study done in Uganda demonstrated significantly higher HIV test uptake among patients who had been diagnosed with TB and started on treatment in the referral hospital and were subsequently referred to a city clinic than among patients who had been diagnosed with TB at the city clinic initially (30).

People seem to place a high value on privacy; that needs careful thought when VCT is offered. Practices that maximize the autonomy of the client seem thus to correspond well with high demands. An important underlying reason for the low response to clinic based VCT is likely to be associated with confidentiality, like the likelihood of meeting someone known to the individual at the local clinic and fear of breach of confidentiality by the clinic staff (25).

The acceptability of VCT in the group randomly allocated to the services at an optional location, i.e. mostly offered at home, was 4.7 times higher than the group allocated at the local clinic. This striking difference in acceptability is of particular relevance as most countries having scaled up their VCT located their services at medical facilities. High uptake of PITC among TB patients is documented in Cameroon (94.7%) and is high among TB patients tested in public hospital related to faith based hospitals (10, 25).

3. Objectives

3.1 General objective

To assess knowledge and behavioral determinants of HIV testing among tuberculosis patients on DOTS in East Wollega Zone, Ethiopia

3.2 Specific objectives

3.2.1 Primary specific objectives

- To identify socio-demographic, knowledge and behavioral determinants related to HIV testing
- To explore factors associated with uptake of HIV testing among tuberculosis patients on DOTS in the study area.

3.2.2 Secondary specific objective

- To describe magnitude of HIV among tuberculosis patients on DOTS in the study area.

4. Methodology

4.1 Study Area

The study was conducted in East Wollega zone, Oromia regional state, Western Ethiopia. East Wollega Zone is one of the zones of Oromia Regional state with a population of 1,230,402 among which 614,761 are males and 615,641 are females. Majority of the population live in rural areas 86% (1,061,120) (31). Nekemte is the capital city of the zone which is located 331km west of Addis Ababa with a population of 76,817 (male 39,167 and female 37,650).

4.2 Study period

The study was conducted from January to February 2011.

4.3 Study design

Institution based unmatched case control study design was used to assess determinants of HIV testing among tuberculosis patients on DOTS. Determinants were assessed among TB patients those who had taken HIV testing (controls) and those refused to accept HIV testing (cases).

Focus group discussion (FGD) was used to triangulate responses on some of the major barriers for HIV testing by the study subjects. From the major variables thought to affect the conformity of the discussion; sex was taken as categorizing criteria since there are some sensitive issues to be discussed. Accordingly, four focus groups was formed for the study, i.e. two FGD from Nekemte hospital and health center both for male and female, two FGD from selected health centers.

4.4 Source and Study population

The source population for the study was all TB patients in East Wollega Zone, while the study population was tuberculosis patients on DOTS who were randomly selected by simple random sampling technique in Nekemte Hospital and six health centers selected in East Wollega Zone.

4.5 Inclusion and exclusion criteria

TB patients aged less than 18 years and those for whom HIV had been diagnosed before TB were not included in the sample. Whereas newly diagnosed, previously registered and those under treatment including all forms of TB in Nekemte Hospital and selected health centers during the study period were recruited into the study.

4.6 Sample Size

The sample size was determined using a formula for estimating two population proportions, 80% power and 5% type I error to approximate an acceptable population parameter and a 10% non response rate was used.

The formula used for calculating the required sample size was computed by using, ever heard about HIV testing (PIHCT) as exposure variable, and taking 1:2 ratio (for one case two controls), since it yields maximum sample size (32).

$$n_1 = \frac{\left[Z_{\frac{\alpha}{2}} \sqrt{\left(1 + \frac{1}{r}\right) P(1-P)} + Z_{\beta} \sqrt{P_1(1-P_1) + \frac{P_2(1-P_2)}{r}} \right]^2}{(P_1 - P_2)^2}$$

Where: P1= the proportion of exposure among cases (27.2)

P2 = the proportion of exposure among controls (11.7)

Z1- α /2= value of standard normal distribution corresponding to a significance level of alpha (1.96 for a two-sided test at the 0.05 alpha level)

Z1- β /2= value of standard normal distribution corresponding to the desired level of power (0.84 for a power of 80%) and

r= a case to control ratio (2)

Total sample size required for the study was 270 tuberculosis patients on DOTS (90 cases and 180 controls).

4.7 Sampling procedure

List of all tuberculosis patients on DOTS was obtained from six health centers selected randomly and Nekemte hospital registration book. Before generating random number subjects were screened for inclusion and exclusion criteria, then simple random sampling technique was employed to select individual study participant.

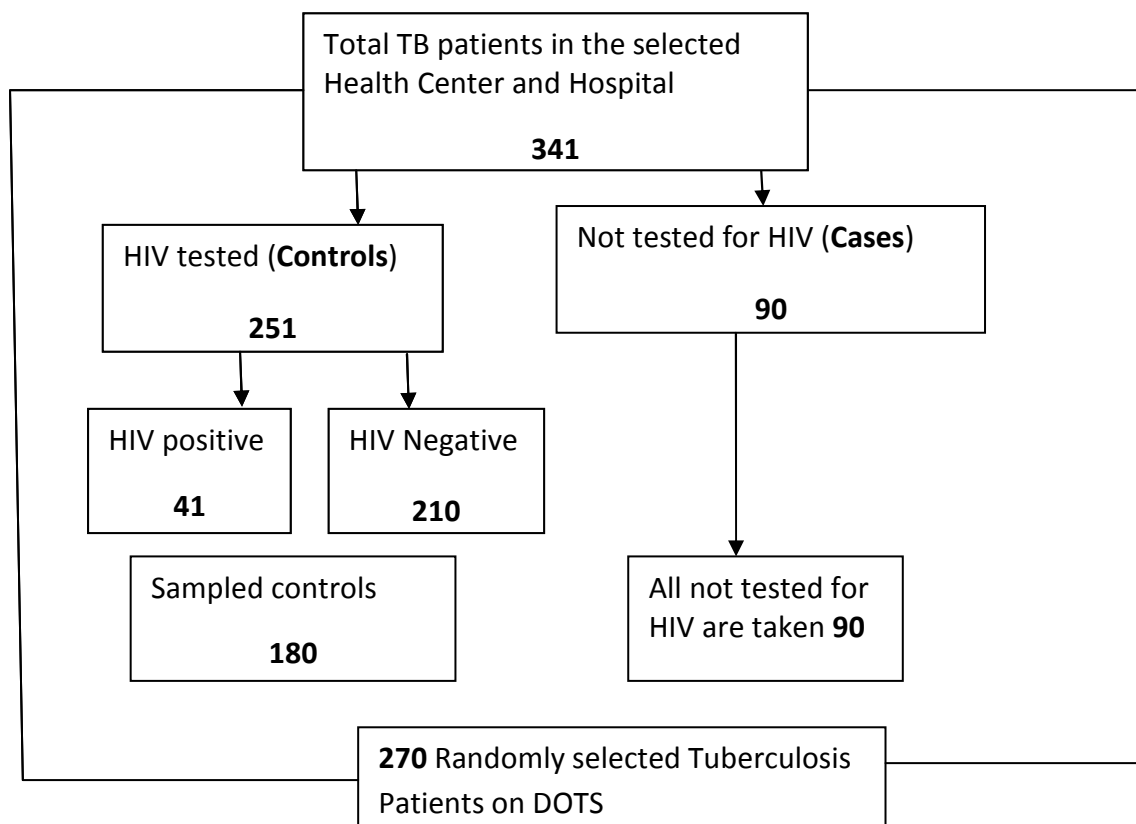


Figure 1. Sampling procedure for assessment of determinants of HIV testing among tuberculosis patients on DOTS in East Wollega zone, Ethiopia 2011.

Questionnaires that were prepared in English language were translated to Afan Oromo language for data collection. The questionnaires contain socio-demographic characteristics, marital status, educational level, type of TB, place of residence, income, distance from health service, HIV related knowledge and intention to use VCT services.

Pre-test of the questionnaire for clarity and consistency of the questions was conducted on 24 tuberculosis patients from Jimma Arjo health center that was not included in selected health centers for final data collection (from similar woredas in East Wollega zone) one week prior to actual data collection. Finally, necessary amendment was made based on the feedback.

Seven data collectors were recruited, three females and four males. Two days training was given to them focusing on the objective of the study and value of collecting the actual data.

Data was collected by nurses trained in data collection; they were selected from their respective TB units. Structured questionnaire were used for data collection by interviewing TB patients after they have received their treatment.

Qualitative data was collected for an effort to gain further insight into and for supplementing individual interview responses. A total of four focus group discussions (FGD), designated by sex was conducted after the quantitative data collection; semi-structured open-ended questionnaires were used in order to provide and strengthen the quantitative findings. The FGD discussants were both cases and controls the ratio of controls to cases range from 2 to 3: 1. The principal investigator moderated the discussion of the male groups while a female nurse was assigned as notetaker and handle the tape recording during the group discussion and she inturn moderated the discussion of the female groups and the principal investigator was assigned as note taker and he handle the tape recording during the discussions.

4.9 Data Processing and Analysis

Quantitative data was entered and cleaned using Epi Info soft ware, and after clearance data was exported to SPSS version 17 for analysis. Thirteen questionnaires were used to assess knowledge regarding tuberculosis and HIV, the questionnaires were then given a mark of one if the respondent answered the question correctly and given zero if the answer was wrong, finally a summary score of all the questions were calculated. The mean of correct answer were used as a cutoff point, respondent who have answered greater than the mean were categorized as knowledgeable and those whose scores were less than the mean were categorized as non-knowledgeable. Similarly seven question were used to assess perceived stigma and discrimination related to HIV, those respondents whose scores were less the mean were categorized as having high perceive stigma and discrimination and those whose scores were greater than the mean were categorized as having low perceived stigma and discrimination.

Frequency count and percentages were done in data analysis for nominal variables. Data on type of TB, place of residence, educational status, distance from given VCT service, sex, age, perceived barriers to VCT and marital status were explored for further association.

Binary logistic regression was used for both bivariate and multivariate analysis. A final model was developed using stepwise forward logistic to see the joint effect of socio-demographic and knowledge, attitude and perceived stigma towards HIV testing. Statistical significance was taken at $p < 0.05$.

In qualitative data field notes, audio-tapes, were the main sources of data for analysis. All FGD was fully transcribed word by word.

4.10 Data quality control

Pretest was conducted out of study subjects to detect any problem in the questionnaire and data collection method. Final English version of the questionnaire was translated into Afan Oromo by an

individual who had a very good command of both English and Afan Oromo languages, and later back translated into English independently by another person, so as to ensure its consistency with the original English version.

All filled questionnaires were checked daily for completeness, accuracy, clarity and consistency by the supervisor and the principal investigator and necessary corrections and changes was made. Completeness and consistency of variables during data entry was checked using frequency distributions. Appropriate statistics was used for describing the variables and their associations. FGD guideline and tape recording was used for qualitative data.

4.11 Study variables

Independent variables

- Socio demographic characteristics (sex, age, education and religion)
- Knowledge, perceived stigma and attitudes of TB patients towards TB/ HIV/AIDS
- Economic factors(income)
- Institutional factors (availability of health institutions providing HCT)

Dependent variable

- HIV testing (state of being tested or not)

4.12 Ethical Consideration

Permission was taken from Ethical review committee of the SPH of Addis Ababa University, East Wollega zonal health office, and study units. Informed verbal consent was obtained from participants. Participants were informed that privacy and confidentiality will be maintained. At individual level after explaining the purpose of the study verbal and written consent was obtained from all participants prior to their participation in the study.

HIV testing that was done prior to data collection by the respective health centers was used and HIV test result were retrieved from TB patient log book during data collection in selected health center in TB clinic, the study subjects were informed that their name or special ID will not be included in the report than HIV status that doesn't contain any information related to individual study subject.

The study units culture, language and value were respected and the study subjects were informed that the study process has no harm to them and confidentiality will be kept.

4.13 Operational Definition

DOTS: Is a strategy of treatment in which the patient is administered his or her medication by a nurse or health worker and is observed taking the medication.

VCT: Is the process, in which an individual undergoes counseling, enabling him or her to make an informed choice about being tested for HIV. A complete VCT includes pre-test counseling, testing, and post-test counseling.

Employment: The state of being employed for temporarily or as a permanent employee, in a government office, regular trade, NGOs etc for wages or salary earning regularly.

5. Result

5.1 Socio-demographic characteristics

The socio-demographic characteristics of respondents are shown in Table 1. Two hundred seventy tuberculosis patients (100% both HIV tested and not tested for HIV) responded to the questionnaire completely. Of these 111 (41.1%) of them were males and 159 (59.9%) were females. The mean age of respondents was 33.52 (± 10.29 SD) for cases and 31.71 (± 11.94 SD) years for controls.

One hundred seventeen (65%) of controls and 56(62.2%) of cases are aged 25-34 years while, 24(26.7%) and 10(11.1%) of cases and 34(18.9%) and 19(10.6%) of controls were aged 35-44 and 45 years or more respectively. Regarding educational status 42(46.7%) of cases and 55(30.6%) of controls were unable to read and write. One hundred four (57.8%) of controls and 47(52.2%) cases have an average monthly income of less than 500 Ethiopian birr. The mean average monthly income of controls was 1243.95 ETB among employed i.e government and NGO employ and 297.45ETB among non-employed i.e daily laborer, students, farmer, house wife, and others. The cases those who were employed have an average monthly income of 1067.06 ETB compared to 317.3 ETB among unemployed. Half (50%) of controls rated their economic status as low while 53(58.9%) of cases rated it as low.

Most of the respondents were Oromo by ethnicity 63(70%) and 120(66.7%) among cases and controls, followed by Amhara 17(18.9%) and 53(29.4%), Guraghe 4 (4.4%) and 5(2.8%) for cases and controls respectively. Forty, (44.4%) and 73(40.6%) of cases and controls were single/never married while, 40(44.4%) and 86(47.8%) of case and controls were married respectively (Table1).

Among 270 tuberculosis patients sampled 245(90.7%) of them come from less than 10km to a nearby health institution in which 84(93.3%) and 161(89.4%) of case and controls reported that they come from greater than 10km or more respectively.

Table 1: Socio-demographic characteristics of Tuberculosis patients on DOTS in East Wollega Zone, Ethiopia, January to February 2011.

Variables	Cases(n=90)	Controls(n=180)	Total (n=270)
Sex			
Male	35(38.9%)	76(42.2%)	111(41.1%)
Female	55(61.1%)	104(57.8%)	159(59.9%)
Age in years			
<25	19(21.1%)	64(35.6%)	83(30.7%)
25-34	32(35.6%)	51(28.3%)	83(30.7%)
35-44	23(25.6%)	36(20%)	59(21.9%)
>=45	16(17.8%)	29(16.1%)	45(16.7%)
Place of residence			
Urban	71(78.9%)	116(64.4%)	187(69.3%)
Rural	19(21.1%)	64(35.6%)	83(30.7%)
Marital status			
Single/Never married	40(44.4%)	73(40.6%)	113(41.9%)
Married	40(44.4%)	86(47.8%)	126(46.7%)
Divorced	4(4.4%)	5(2.8%)	9(3.3%)
Widowed	6(6.7%)	16(8.9%)	22(8.1%)
Ethnicity			
Oromo	63(70%)	120(66.7%)	183(67.8%)
Amhara	17(18.9%)	53(29.4%)	70(25.9%)
Tigre	3(3.3%)	2(1.1%)	5(1.9%)
Others	7(7.7%)	5(2.8%)	12(4.4%)
Religion			
Orthodox	27(30%)	69(38.3%)	96(35.6%)
Muslim	55(61.1%)	68(37.8%)	123(45.6%)
Protestant	5(5.6%)	38(21.1%)	43(15.9%)
Catholic	3(3.3%)	5(2.8%)	8(3%)
Highest level of education			
Unable to read and write	42(46.7%)	55(30.6%)	97(35.9%)
Primary	7(7.8%)	36(20%)	43(15.9%)
Secondary	18(20%)	40(22.2%)	58(21.5%)
High school and above	23(25.6%)	49(27.2%)	72(26.7%)
Employment status			
Employed	16(17.8%)	22(12.2%)	38(14.1%)
Unemployed	74(82.2%)	158(87.8%)	232(85.9%)
Distance from health institution			
<=10km	84(93.3%)	161(89.4%)	245(90.7%)
>10km	6(6.7%)	19(10.6%)	25(9.3%)
Average monthly income(ETB)			
<500	47(52.2%)	104(57.8%)	151(57.9%)
500-1000	12(13.3%)	18(10%)	30(11.1%)
>1000	7(7.8%)	10(5.6%)	17(6.3%)
No income	24(26.7%)	48(26.7%)	72(26.7%)

5.2 Knowledge, attitude and perceived stigma towards TB/HIV

Thirteen questions were asked to assess knowledge and seven questions were also used to assess perceived stigmatized attitude towards TB/HIV, then for respondents who answered the question correctly a mark of one was given and zero was given for wrong answers. Accordingly mean value of correct answer was calculated and respondents scoring less than mean value were categorized as having low knowledge and high stigmatizing attitude.

As indicated in Table 2 two hundred forty seven (91.5%) of the respondents i.e 87(96.7%) of cases and 160(88.9%) of controls heard about TB (before they know they are infected with TB and started treatment), for whom mass media being the main source of information 188(76.1 %*), followed by health institution 33(13.4 %*), news paper 32(12.9%*) and others like peer and parents/relatives 17(6.9%*) (*the percentages can't add up to 100 since multiple response was possible).

Regarding knowledge 48(17.8%) of cases and 34(18.9%) of controls reported that the poor are at risk of being infected with tuberculosis while people living with TB patient 64(71.1%)of cases and 83(46.1%) of controls, smokers/alcolics 7(7.8%) of cases and 27(15%) of controls, people living in the rural area 5(5.6%)of cases and 12(6.7%) of controls mentioned as they are at risk of being infected with TB.

Twenty four (26.7%) of cases and 95(52.8%) controls mentioned that there is relationship between TB and HIV, while 22(24.4%) of cases and 95(55%) controls believe that TB increase after the era of HIV/AIDS.

Four, (4.4%) and 13(7.2%) of case and controls believe that HIV can be cured while, 74(82.2%) of cases and 124(68.9%) controls reported that healthy looking person can be infected with HIV respectively. More than half (52.8%) of controls and 24(26.7%) cases have also identified that there is relationship between TB and HIV, in which 23.3% and 50.6% of cases and controls think that control of HIV/AIDS can help prevent spread of TB(Table 2).

Regarding type of TB, stage of treatment and previous history of TB, more than one third (35.6%) of the respondents are smear positive pulmonary TB while 114(42.2%) and 60(22.2%) are smear negative and extra pulmonary TB respectively. One hundred twenty four (45.9%) of them are on intensive phase while 146(54.1%) of them are on continuous phase of treatment, from these 11(4.1%) of them had previous history of TB.

One fourth (75.2%) of the respondents rate their satisfaction with current treatment given to them as good and 15(5.6%) of them rate it as poor while the remaining 52(19.3%) rate it as moderate (Table 2).

Less than one third of controls (30.6%) and 66(76.3%) cases said that they are not willing to be tested if someone they knew is offering HCT. Whereas 2.2% of cases and 33(18.3%) controls think that PLWA should be quarantined.

Table 2: Percentage distribution of knowledge, attitude and perceived stigma towards TB/HIV among Tuberculosis patients on DOTS in East Wollega Zone, Ethiopia, January to February 2011.

Variables	Cases(n=90)	Controls(n=180)	Total(n=270)
Heard about TB(ever/before sickness)			
Yes	87(96.7%)	160(88.9%)	247(91.5%)
No	3(3.3%)	20(11.1%)	23(8.5%)
Source of Information			
Radio/Television	76(87.36%)	112(70%)	188(76.11%)
News paper/Magazines	4(4.6%)	28(17.5%)	32(12.95%)
Parent/relatives	5(5.75%)	11(6.87%)	16(6.48%)
Health institution	5(5.75%)	28(17.5%)	33(13.36%)
Others	0	1(0.625%)	1(0.4%)
Afraid of being infected with TB			
Yes	4(4.4%)	30(16.7%)	34(12.6%)
No	86(95.6%)	150(83.3%)	236(87.4%)
Who is at risk of getting TB			
The poor	14(15.5%)	34(18.9%)	48(17.8%)
Rural people	5(5.6%)	12(6.7%)	17(6.35%)
Those who live with TB	64(71.1%)	83(46.1%)	147(54.4%)
Smokers/Alcolics	7(7.8%)	27(15%)	34(12.6%)
Others	0	24(13.3%)	24(8.8%)
As a TB patient reveal it to others			
Yes	44(48.9%)	122(67.8%)	166(61.5%)
No	46(51.1%)	58(32.2%)	104(38.5%)
Type of TB			
Smear positive PTB	40(44.4%)	56(31.1%)	96(35.6%)
Smear negative PTB	44(48.9%)	70(38.9%)	114(42.2%)
Extra pulmonary TB	6(6.7%)	54(30%)	60(22.2%)
Heard about HIV/AIDS			
Yes	90(100%)	171(95%)	261(96.7%)
No	0	9(5%)	9(3.3%)
Healthy looking person can be infected with HIV			
Yes	74(82.2%)	124(68.9%)	198(73.3%)
No	16(17.8%)	56(31.1%)	72(26.7%)
There is relationship between TB and HIV			
Yes	24(26.7%)	95(52.8%)	119(44.1%)
No	66(73.3%)	85(47.2%)	151(55.9%)
TB increase after era of HIV			
Yes	22(24.4%)	99(55%)	121(44.8%)
No	68(75.6%)	81(45%)	149(55.2%)
Control of HIV/AIDS prevent spread of TB			
Yes	21(23.3%)	91(50.6%)	112(41.5%)
No	69(76.7%)	89(49.4%)	158(58.5%)
HIV/AIDS can be cured			
Yes	4(4.4%)	13(7.2%)	17(6.3%)
No	86(95.6%)	167(92.8%)	153(93.7%)

Person can get HIV from mosquito bite			
Yes	21(23.3%)	35(19.4%)	56(20.7%)
No	69(76.7%)	145(80.6%)	214(79.3%)
One gets HIV by sharing meal with someone infected with HIV			
Yes	5(5.6%)	28(15.6%)	33(12.2%)
No	85(94.4%)	152(84.4%)	237(87.8%)
One gets HIV by shaking Hands and clothes living with HIV/AIDS			
Yes	5(5.6%)	30(16.7%)	35(13%)
No	85(94.4%)	150(83.3%)	235(87%)
Having many sexual partner increases ones risk of being infected with HIV/AIDS			
Yes	85(94.45)	151(83.9%)	236(87.4%)
No	5(5.6%)	29(6.1%)	34(12.6%)
People protect themselves from HIV by using a condom correctly every time they had sex			
Yes	49(54.4%)	116(64.4%)	165(61.1%)
No	41(44.6%)	64(35.6%)	105(38.9%)
Once infected person can infect others for the rest of his/her life			
Yes	87(96.7%)	132(73.3%)	219(81.1%)
No	3(3.3%)	48(26.7%)	51(8.9%)
Knowledge(able) about TB/HIV			
Poor(No)	44(48.9%)	37(20.6%)	81(30%)
Good(Yes)	46(51.1%)	143(79.4%)	189(70%)
PLWA should be quarantined			
Yes	2(2.2%)	33(18.3%)	35(13%)
No	88(97.8%)	147(81.7%)	235(87%)
Share meal with someone having AIDS			
Yes	72(80%)	145(80.6%)	217(80.4%)
No	18(20%)	35(19.4%)	53(19.6%)
Afraid of PLWA			
Yes	26(28.9%)	56(31.1%)	82(30.4%)
No	64(71.1%)	124(68.9%)	188(69.6%)
Work with PLWA			
Yes	76(84.4%)	154(85.6%)	230(85.2%)
No	14(15.6%)	26(14.4%)	40(14.8%)
Willing to care for relatives having HIV			
Yes	76(84.4%)	178(98.9%)	254(94.1)
No	14(15.6%)	2(1.1%)	16(5.9%)
Perceived stigma and discrimination			
Low	58(64.4%)	155(86.1%)	213(78.9%)
High	32(35.6%)	25(13.9%)	57(21.1%)

5.3 HIV testing

Seventy six (84.4%) of cases and 170(94.4%) controls have ever heard about HIV testing (VCT, PIHCT). The main sources of information were mass media 57(68.7%), 135(69.6%), news paper 10(12.1%), 30(15.5%) and family/relatives 8(9.6%), 17(8.8%) for cases and controls respectively. The respondents were also asked if they knew where to get HIV counselling and testing (HCT), 83(92.2%) of cases and 168(93.3%) controls reported that they know where to get HCT. However less than half of cases 46.7% agreed that HCT is important compared to 168(93.3%) of controls arguing that HCT is important. In addition to this more than half 51(56.7%) of case and 10(5.6%) controls claim that there is no benefit of being tested for HIV (Table 3).

Reasons like not sure of confidentiality, afraid of AIDS stigma and don't want to know the test result were mentioned as the reasons for not accepting HIV testing. From document review among from a total of 342 TB patients in the selected health centers and hospitals 251(73.4%) of them had been tested for HIV, in which 41(16.3%) of them found to be HIV positive.

Seven (3.9%) of controls and 10(11.1%) cases claim that they did not receive pretest counselling. All respondents (controls) who have tested for HIV have heard their HIV test result in which 23(12.8%) of them are HIV positive and 157(87.2%) of them are HIV negative. The proportion of HIV infected individual was 10(13.2%) among males and 13(12.5%) among females, while its 19(16.4%) among TB patients from urban and 4(6.2%) among those from rural area. Less than ten percent (9.1%) of employed and 21(13.3%) among those who are unemployed tuberculosis patients are also infected with HIV. Smear negative pulmonary TB patients are more infected 13(18.6%) with HIV compared to smear positive 6(10.7%) and extra pulmonary TB 4(7.4%).

TB/HIV co-infection was also high among tuberculosis patients in the age group 25-34 10(19.6%) compared to those in the age group <25 7(10.9%), 35-44 4(11.1%) and 45+ 2(6.9%) respectively. One hundred seventy five (97.2%) of them have received post test counselling, that yields complete HCT among sampled population to be 97.2%. The mean time the patient waits to take test result was 27.56(±22.54 SD) minutes (range 5 -120 minutes). One hundred forty five (80.6%) of the respondents claim that the test was initiated by health workers, followed by myself 26(14.4%) and friends 9(5%).

Table 3: HIV test uptake and related factors among tuberculosis patients on DOTS in East Wollega Zone, Ethiopia, January to February 2011.

Variables	Cases (n=90)	Controls (180)	Total (270)
Heard about HCT(VCT,PIHCT)			
Yes	76(84.4%)	170(94.4%)	251(93%)
No	14(15.6%)	10(5.6%)	19(7%)
Source of information			
Health workers/facility	57(68.67%)	135(69.59%)	192(69.31%)
Mass media	10(12.05%)	30(15.46%)	40(14.44%)
Friends	8(9.64%)	11(5.67%)	19(6.86%)
Others	8(9.64%)	18(9.28%)	26(9.39%)
Know where to get HCT			
Yes	83(92.2%)	168(93.3%)	251(93%)
No	7(7.8%)	12(6.7%)	19(7%)
Pretest counseled			
Yes	80(88.9%)	173(96.1%)	253(93.7%)
No	10(11.1%)	7(3.9%)	17(6.3%)
Do you agree that HCT is important			
Yes	42(46.7%)	168(93.3%)	210(77.8%)
No	48(53.3%)	12(6.7%)	60(22.2%)
Is there benefit of being tested for HIV			
Yes	39(43.3%)	170(94.4%)	209(77.4%)
No	51(56.7%)	10(5.6%)	61(22.6%)
Is it possible in the community to get confidential testing			
Yes	64(71.1%)	134(74.4%)	198(73.3%)
No	16(28.9%)	46(25.6%)	62(26.7%)
Willing to use voluntary HCT in the future			
Yes	4(4.4%)	149(82.8%)	153(56.7%)
No	86(95.6%)	31(7.2%)	117(43.3%)
Reason for not using HCT			
Not sure of confidentiality	16(18.6%)	22(70.96%)	38(32.48%)
Afraid of AIDS stigma	47(54.65%)	8(25.8%)	55(47.01%)
Don't want to know the result & others	23(26.74%)	1(3.23%)	24(20.51%)
Method preferred to obtain HIV test result			
Face to face	78(86.7%)	172(95.6%)	250(92.6%)
Telephone	2(2.2%)	1(0.6%)	3(1.1%)
Secretive letter	9(10%)	3(1.7%)	12(4.4%)
Relative or partner	1(1.1%)	4(2.2%)	5(1.9%)
Health professional preference to offer HCT			
Medical doctors	46(51.1%)	78(43.3%)	124(45.9%)
Nurses	29(32.2%)	55(30.6%)	84(31.1%)
Health officers	1(1.1%)	21(11.7%)	22(8.1%)
Any one	14(15.6%)	26(14.4%)	40(14.8%)

One hundred seventy six (65.2%) of the respondents' had sex in the past 12 months, in which 140(79.5%), 29(16.5%) and 7(4%) of them had sex with regular partner/wife, non regular partner and commercial sex workers (CSW) respectively. Less than one fourth 39(22.15%) of the respondents have used condom, and the frequency of condom use was reported as 21(11.9%), 13(7.4%), 18(10.2%) and 127(72.2) used every time, almost every time, sometimes and never respectively.

5.4 Factors associated with acceptance of HIV testing

Factors associated with HIV testing were assessed using three models;

1. Socio demographic determinants,
2. Knowledge and behavioral determinants,
3. Joint effect of socio-demographic and behavioral characteristics.

The final model was obtained using stepwise forward regression $P \leq 0.3$ and socio-demographic and behavioral factors showing significant association on crude/multivariate analysis were included in the final model (3rd model).

5.4.1 Multi-variate logistic regression of socio-demographic characteristics.

On crude analysis being from urban COR 2.062(CI 1.142, 3.723), Muslim COR 2.067(CI 1.170, 3.653) by religion and age group 25-34 COR 2.114(CI 1.075, 4.157) and 35-44 COR 2.152 (CI 1.035, 4.475) were found to be significantly associated with not accepting HIV test compared to those aged less than 25 years old. After controlling for other socio-demographic variables being from urban AOR 3.044(CI 1.338, 6.925) and Muslim by religion [AOR 2.610(CI 1.228, 5.545) were found to be associated with not tested for HIV.

Having primary, secondary or high school and above level of education and being widowed were associated with accepting HIV test on multivariate analysis, while being protestant and having primary level of education shows significant association to undergo HIV testing (Table4).

Table 4: Multi-variate logistic regression analysis of socio-demographic characteristics among tuberculosis patients on DOTS in East Wollega zone, Ethiopia 2011.

Variables	Cases	Controls	COR(95% CI)	AOR(95% CI)
Sex				
Male	35	76	1.00	1.00
Female	55	104	1.148(.685, 1.925)	1.379 (.715, 2.660)
Age in years				
<25	19	64	1.00	1.00
25-34	32	51	2.114(1.075, 4.157)	2.111(0.880, 5.067)
35-44	23	36	2.152(1.035, 4.475)	2.584(0.896, 7.453)
>=45	16	29	1.858(0.838, 4.122)	2.299(0.695, 7.598)
Place of residence				
Urban	71	116	2.062(1.142, 3.723)	3.044(1.338, 6.925)
Rural	19	64	1.00	1.00
Marital status				
Single/Never married	40	73	1.00	1.00
Married	40	86	0.849(0.496, 1.454)	0.459(0.204, 1.032)
Divorced	4	5	1.460(0.371, 5.746)	0.485(0.090, 2.609)
Widowed	6	16	0.684(0.248, 1.887)	0.173 (0.041, 0.731)
Ethnicity				
Oromo	63	120	1.00	1.00
Amhara	17	53	0.611(0.327, 1.142)	0.975 (0.430, 2.211)
Tigre	3	2	2.857(0.465, 17.546)	2.912 (0.419, 20.230)
Others	7	5	2.667(0.813, 8.743)	4.201(1.002, 17.608)
Religion				
Orthodox	27	69	1.00	1.00
Muslim	55	68	2.067(1.170, 3.653)	2.610 (1.228, 5.545)
Protestant	5	38	0.336(0.120, 0.945)	0.390 (0.121, 1.255)
Catholic	3	5	1.533(0.343, 6.864)	1.916(0.349, 10.521)
Highest level of education				
Unable to read and write	42	55	1.00	1.00
Primary	7	36	0.255(0.103, 0.629)	0.190(0.064, 0.566)
Secondary	18	40	0.589(0.297, 1.170)	0.362(0.151, 0.867)
High school and above	23	49	0.615(0.325, 1.163)	0.145(0.045, 0.475)
Employment status				
Employed	16	22	1.00	1.00
Unemployed	74	158	0.644(0.320, 1.298)	0.657(0.142, 3.028)
Distance from health institution				
<=10km	84	161	1.00	1.00
>10km	6	19	0.605(0.233, 1.573)	1.178(0.337, 4.118)
Average monthly income(ETB)				
<=500	47	104	0.904(0.497, 1.645)	0.799(0.382, 1.672)
501-1000	12	18	1.333(0.553, 3.213)	1.468(0.367, 5.872)
>1000	7	10	1.400(0.474, 4.135)	0.933(0.152, 5.707)
No income	24	48	1.00	1.00

Variables showing significant association on crude/multivariate analysis were included in the final model

5.4.2 Logistic regression analysis of knowledge, attitude and perceived stigma towards HIV

Being not knowledgeable about HIV and high perceived stigma and discrimination towards HIV and PLWHA shows significant association in refusing HIV testing both on crude and multi variate analysis. The most reasons claimed for not using HIV testing if the service is available at a nearby health institution (n=117) were, not sure of confidentiality 38(32.5%), afraid of AIDS stigma 55(47%), don't want to know the result 22(18.8%) and others 2(1.7%) respectively.

Tuberculosis patients those who have; heard about HIV testing AOR 0.287(CI 0.084, 0.983), positive perceived benefit of being tested for HIV AOR 0.029(CI 0.003, 0.338) and the likely to accept HCT if provided house to house AOR 0.114(CI 0.049, 0.269) are more likely to undergo/accept HIV testing.

Poor satisfaction with current treatment have shown significant association for not accepting HIV testing both on bivariate and multi variate analysis.

The perception that having many sexual partner will increases once risk of getting HIV/AIDS have shown significant association for not accepting HIV testing on crude analysis COR 3.265(1.219, 8.748) while it didn't show significant association on multivariate analysis AOR 2.237(CI 0.735, 6.809)(Table 5).

Having sex with non-regular partner found to be associated with rejecting HIV testing both on crude and multi variate analysis COR 2.550(CI 1.128, 5.766), AOR 4.332 (CI 1.505, 12.472) respectively after controlling for other sexual risk behavior like frequency of condom use, consistence and correct use of condom decrease the risk of contracting HIV/AIDS and having multiple sexual partner increase once risk of getting HIV/AIDS.

Table 5: Logistic regression analysis of knowledge, attitude and perceived stigma towards HIV among tuberculosis patients on DOTS in East Wollega zone, Ethiopia 2011.

Variables	Cases(90)	Controls(180)	COR (95%CI)	AOR(95%CI)
Ever heard about HIV testing (VCT, PICT)				
Yes	76	170	0.319(0.136, 0.751)	0.287(0.084, 0.983)
No	14	10	1.00	1.00
Is there benefit of being tested for HIV				
Yes	39	170	0.045(0.021, 0.096)	0.029(0.003, 0.338)
No	51	10	1.00	1.00
HCT is important				
Yes	42	168	0.063(0.031, 0.128)	3.399(0.283, 40.805)
No	48	12	1.00	1.00
Is there confidential counselling in your area				
Yes	64	134	0.845(0.480, 1.488)	1.843(0.782, 4.346)
No	26	46	1.00	1.00
Accept VCT if provided house to house				
Yes	16	132	0.079(0.042, 0.148)	0.114(0.049, 0.269)
No	74	48	1.00	1.00
Work with PLWHA coworker				
Yes	76	154	0.917(0.453, 1.856)	2.117(0.642, 6.978)
No	14	26	1.00	1.00
Satisfaction with current treatment				
Good	52	151	1.00	1.00
Moderate	26	26	2.904(1.549, 5.443)	2.193(0.882, 5.451)
Low	12	3	11.615(3.154, 42.783)	13.669(2.557, 73.068)
Knowledgeable				
No	44	37	3.697(2.135, 6.402)	2.673(1.169, 6.112)
Yes	46	143	1.00	1.00
Perceived stigma and discrimination				
High	32	25	3.421(1.870, 6.257)	1.955(1.014, 5.507)
Low	58	155	1.00	1.00

Variables showing significant association on crude/multivariate analysis were included in the final model

5.4.3 Joint effect of socio-demographic characteristics and knowledge, attitude and perceived stigma towards HIV

A final model using stepwise forward method using P-value <0.3 was used to describe the joint effect of socio-demographic variables and knowledge and behavior variables related to HIV testing that have shown significant association on crude/multivariate analysis was used and a variable having P-value of <0.05 was used for significant association.

Patients having positive perceived benefit of HIV testing and accepting HCT if offered house to house were less likely to reject HIV testing both on crude and multi variate analysis (Table 6).

Table 6: Joint effect of socio-demographic variables and knowledge, attitude and perceived stigma related to HIV among Tuberculosis patients on DOTS in East Wollega zone, Ethiopia 2011.

Variables	Cases	Controls	COR(95%CI)	AOR(95%CI)
Religion				
Orthodox	27	69	1.00	1.00
Muslim	55	53	2.067(1.170, 3.653)	6.280(2.360, 16.710)
Protestant	5	2	0.336(0.120, 0.945)	0.453(0.110, 1.870)
Catholic	3	5	1.533(0.343, 6.864)	7.756(0.693, 86.777)
Place of residence				
Urban	71	116	2.062(1.142, 3.723)	5.692(1.930, 16.783)
Rural	19	64	1.00	1.00
There is benefit of being tested for HIV				
Yes	39	170	0.045(0.021, 0.096)	0.085(0.031, 0.231)
No	51	10	1.00	1.00
Accept VCT if offered house to house				
Yes	16	132	0.079(0.042, 0.148)	0.087(0.035, 0.215)
No	74	48	1.00	1.00
Satisfaction with current treatment				
Good	52	151	1.00	1.00
Moderate	26	26	2.904(1.549, 5.443)	4.432(1.571, 12.505)
Poor	12	3	11.615(3.154, 42.783)	13.193(1.777, 97.962)
Knowledgeable about HIV				
No	44	37	3.697(2.135, 6.402)	4.709(1.822, 12.168)
Yes	46	143	1.00	1.00
Perceived stigma and discrimination				
Low	32	25	3.421(1.870, 6.257)	4.889(1.556, 15.366)
High	58	155	1.00	1.00

5.5 Main findings from Focus group discussion

- Majority of participants mentioned that they have heard about HIV/AIDS
- I have heard in a social gathering(man 40 years from rural area)
- Major disease among the young people (old woman from rural area)
- It's mostly transmitted if one is not faithful or having sex with more than one partner(old man)
- It is same to other chronic diseases (young boy)
- I don't need to be tested I have no support if I'm positive(man 30years)
- It's not all time information (by most of the participants)
- I'm TB patient what is the need to be tested for HIV?(man 40years)
- Its giving blood and knowing HIV status (girl 22years)
- Opportunity to know self early and take measure (woman 32years)
- I'm tested positive and had started ART, for a time its hard to live in the community (woman 35 years)
- Its better if all people can be tested (woman 40 years)
- I'm married so what is the need to be tested?(woman 30years)
- I'm coming with cough, what is the need to take blood?(man 60years)
- I know myself, I don't need to be tested(man 35years)
- Confidentiality of test have to be kept and test result should have to be given same day (young boy)
- It takes long time to be tested, so I was thinking that can I be positive/negative, you will die in tension, so better not to be tested or the time should have to be short (female 23years)
- The test result must be face to face in presence of nobody else except the one who provide testing(all participants)

6. Discussion

This study, first of its kind in the area, provides information regarding determinants of HIV testing among Tuberculosis patients on DOTS in East Wollega zone.

Tuberculosis is the initial clinical manifestation of HIV disease for many people in sub-Saharan Africa, and a very high proportion of TB patients in this region are co-infected with HIV. HIV counseling and testing of TB patients is therefore an important method for identifying HIV-infected individuals, all of whom require HIV care and many of whom are indicated for antiretroviral therapy (5).

A patient registration document review of 73.3% HIV test acceptance among TB patients in the source population is low compared to other African countries like Malawi and Cameroon (10, 33) and lower than the targeted >80% HIV testing among TB patients as a MDG (1). This could be associated with lack of information about HIV testing and perceived benefit of being tested for HIV and the perception that, TB patients may think that, there is no relationship between TB and HIV. And some of the reasons for low HCT up take may be related to collaborative TB/HIV activity, as one of FGD discussant also raised:-

It takes long time to be tested like one to two hours and you go somewhere else to give blood, I was thinking that can I be positive/negative, you will die in tension while waiting for result, so better not to be tested or the test should have to be done by the one giving me the medication and hear the result there (female 23years from rural).

Respondents who have heard about HCT are less likely to reject HIV testing than their counter parts AOR 0.287(0.084, 0.983), the proportion of respondents who have heard about HCT in the former study is higher 92.96% Vs 70.2% compared to study done in southern part of the country (34) possible reasons could be difference in population being studied, as tuberculosis patients have visited health facilities several times compared to general population. Even though there is gap in information dissemination as participants from FGD said:

The information we hear regarding testing for HIV is not all time information we hear like one or two times in a year, its better if this gap can be minimized like one to three times in a month, so the likely to hear the information by many people could be increased and then more people can be tested (woman 35years), others have also agreed on the point by nodding their head.

Less than ten (7%) of participants in this study didn't know where to get HIV testing, which is probably located in the facility where they are receiving TB treatment, this indicates that TB patients were not sufficiently informed about HIV testing services.

The proportion of tuberculosis patients who were knowledgeable about HIV was low 70% compared to findings from North Gondar (35) and the level of knowledge was high among urban residents compared to rural AOR 2.36(CI 1.224, 4.549), the same result was also found in China where knowledge and negative attitudes are related to level of education and place of residence i.e urbans are more knowledgeable (23), possible reasons could be those in the urban area are more accessible to information easily and the level of education was different among TB patients from urban and rural area the higher the level of education the more likely to be from urban area. It was also well articulated during FGD;-

It's a disease that is transmitted if one is having sex with more than one partner and the bad side of this disease is, it's not curable (young man).

There are also perceptions and concerns for undertaking HIV test like being married and post test consequences raised by FGD participants:

I'm married and it's a taboo in the community for a married woman to do sex with other person, and there is no one infected with HIV in our community, so what is the need to be tested?(woman 30years).

I come here for treatment of TB 'daranyoo sombaa' what makes it related with this disease/disease of the time 'dhibee baraa' (man 60years).

It's good to be tested but who cares for me if I'm positive and it's hard to live in the community being HIV positive? (man 30years)

Higher proportion of respondents 93% knew where to get HCT and 77.4% of the respondents perceive that there is benefit of being tested for HIV which are both associated with HIV test acceptance, compared to study done in China where only 34.2% know where to get HCT and 65.6% perceive that there is benefit of being tested for HIV (23), this higher level of knowledge can serve as an entry point for high acceptance rate for HIV testing among TB patients after follow up and continuous intervention, and the use of well trained counselors as suggested by Angotti N et al (14). Study done in North West Ethiopia also revealed that ever heard of HIV testing and perceived benefit of HIV testing are associated with HIV test acceptance, while a study by Kalichman et al shows that individuals who hadn't been

tested for HIV were significantly less likely to view beneficial outcome from HIV testing, more likely to perceive adverse testing outcomes and more likely to endorse test avoidance (32, 36).

Tuberculosis patients those who have received pretest counselling were less AOR 0.324(0.119, 0.881) likely to reject HIV testing compared to those who didn't receive pretest counselling. A study done in Northern part of the country also revealed that up to 76.1% of missed opportunities can be attributed to service providers and it accounts for loss of 51.7% HIV diagnosis among these losses, and study by Rodger et al indicates that any patient with TB who are not offered HIV testing is a missed opportunity for testing undiagnosed HIV infected patient (15, 37). Its recommended that clients presenting with symptoms or signs of illness possibly attributable to HIV, it is a basic responsibility of health care providers to recommend HIV testing and counselling as part of routine clinical management and as a standard part of health care for everyone attending health facilities in generalized HIV epidemics (2, 38).

Complete HIV test uptake (pretest counseled, tested, post test counseled and receive test) was 96.1 % and its comparable with 96% VCT acceptance among men from Uganda (39) and its high compared to findings from other part of the country (9). This could be related with those who have tested for HIV might have low personal risks to be HIV positive and even they may be motivated to accept and receive their test result whatever the test result is.

More than half of TB-HIV co-infection 56.5% have been observed among smear negative pulmonary TB patients, even though there is no significant difference between them this suggests that, individual infected with HIV are not identified early as this study have recruited tuberculosis patients those for whom HIV had not been diagnosed before TB.

A total of 16.3% (41/251) of TB patients(in the source population) are also co-infected with HIV, however its low compared to the findings from other part of the country (9, 32) and other African countries (24, 33), but is still high compared to the national finding of ANC based surveillance from the area which is 10.4 (40) even though there is difference in population studied (pregnant women, routine clients coming for medical treatment compared to TB patients). The prevalence is high among, TB patients from urban 19(16.4%) area compared to rural 4(6.2%) and it also decreases as age increase except in the age group 25-34 for whom the prevalence was high, but there is no significant difference for both place of residence and age group which is contrary to findings from Cameroon and Agra India (10, 41). This might be related with low case detection rate in our country while the aforementioned

countries have high case detection rates and this could result in small denominator in our country compared to the aforementioned countries.

Tuberculosis patients who rated the treatment given to them as moderate or poor were more likely to reject HIV testing compared to those who rated current treatment given to them as good. This may be related to logistics system in availing anti TB medications earlier as most health centers receive the medications from Woreda/zonal health bureaus and patients perceived current level of illness and giving less attention to the disease that is not currently found in them.

Of the top reasons claimed for not accepting HIV testing not sure of confidentiality and afraid of AIDS stigma accounts for 32.5% and 47% respectively, and this is higher compared to study done in china (23). Concern for confidentiality about HIV testing was also raised during FGD as:-

...you go and give blood alone for HIV test for the one who is testing you (from whom you take medication) but, in the community you hear that this (sometimes even in front of you pointing your finger) man/woman is HIV positive so who tell the community the HIV test result? So it's good for me if health professional (I mean this may be only some of them) keep the confidentiality, otherways its better for me not to be tested us if I were tested positive and stigmatized by the community (young boy 21 years).

Risky sexual behaviors like having multiple sexual partner will increase once risk of getting AIDS and sex with non-regular partner were found to be associated with rejecting HIV testing, VCT use among men from Uganda and other study from South Africa also shows that clients who are not tested for HIV are engaged in risky sexual behavior including multiple sexual behavior, unprotected sex, never used condom and are injecting drug users (36, 39). This suggests that TB patients who are engaged in high risk sexual practices might fear about the consequence of post HIV test results, and therefore less likely to undergo HIV testing. Contrary to this study, study done by Siyan et al in Cambodia shows that VCT users had significantly higher HIV risks including more experience of receiving sexually transmitted infections (STI) diagnosis and having genital ulcer (42). Suggesting that there is difference in perceived risks associated with testing for HIV as those who perform risky sexual behavior fear to be tested in the current study while others are eager to know their status associated with their risky behavior.

Tuberculosis patients those who would accept HIV testing if provided house to house are more likely to undergo HIV testing. Other study from Cambodia also shows that TB patients treated at clinics without onsite or nearby HIV testing are less commonly tested for HIV and making HIV testing available to TB

patients without the necessity of travelling to a distance HIV testing site is likely to increase HIV testing rates (17). This study also tries to describe HIV testing in relation to countries health infrastructure system considering the lowest health facility providing HIV testing to be health centers and we have classified presence of HIV testing site as within 10km and above 10km distance but there is no significant difference among those coming within 10km radius and above 10km distance to a nearby health institution providing HIV testing AOR 1.178(CI 0.337, 4.118)

7. Limitation and strength of the study

7.1 Limitation of the study

- As with all case control surveys, this study is not free from response and recall bias.
- Perceived desirability of responses rather than actual problem could as well introduce response biases

7.2 Strength of the study

- Standardized questionnaires were adapted from other surveys
- Comparability of both cases and controls are at risk of the disease.
- Use of random sampling technique
- Employment of qualitative and quantitative method

8. Conclusion

- Among socio-demographic determinants place of residence was found to be associated with HCT uptake.
- Low (being not knowledgeable about HIV) level of knowledge and high level of stigma and discrimination are associated with not being tested for HIV.
- The presence of stigma and discrimination related to HIV/AIDS still remain the main challenge specifically among TB/HIV patients as they are suffering from double burden of disease.
- The desire to have HIV testing at home is associated with HIV testing
- Performing risky sexual behavior like having sex with non-regular partner and infrequent use of condom were associated with HCT acceptability to be low.
- The likelihood of missing pretests counseling for tuberculosis patient is associated with low utilization of HIV testing.
- The rate of TB-HIV co-infection is high among TB patients in the study area.

9. Recommendation

- The notion of knowledge regarding HIV/AIDS should have to be emphasized and needs due attention as having low knowledge about HIV/AIDS is associated with rejecting HIV testing. Efforts to promote HIV testing utilization require effective strategies to reduce stigmatizing beliefs towards HIV and PLWHA among TB patients.
- Health information dissemination regarding HIV testing and risky sexual behavior reduction should have to be targeted most at risk population like tuberculosis patients.
- Even though PIHCT is crucial and recommended as an entry point, most tests are initiated by health professionals at health setting, and there is missed opportunities for a TB patient to undertake HIV testing, if the health professional didn't initiate the testing process, so the TB patients those previously thinking that there is no need of being tested for HIV while they are TB would miss the opportunity to know one's status at an earlier time. So health professionals should initiate HIV testing process among tuberculosis patients.
- The setup at which HCT is offered need to be revised, as many clients desire to have HCT at optional level (house to house) and health care workers specifically those in close service with tuberculosis patients should encourage TB patients to undergo HIV testing. So one can be benefitted in early diagnosis and subsequent care and treatment for ART or one can decrease potential risks that may be associated with HIV.
- Confidentiality of test have to be kept as this decrease mutual understanding between TB patients and health care workers.
- Factors associated with rejecting HIV testing among tuberculosis patients from urban area needs to be explored.
- Further research is needed to investigate; TB patients on DOTS among whom HIV have been diagnosed those who have started ART and the need to have HIV testing at optional site like house to house.

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11. Appendices

11.1 Consent form

**Addis Ababa University
College of Health Sciences
School of Public Health**

Determinants of HIV testing among tuberculosis patients on DOTS in East Wollega Zone, Ethiopia 2011.

A. Consent form

I, the undersigned have been informed that the purpose of this particular research project is to study determinants of HIV testing among tuberculosis patients in East Wollega zone. I have been informed that I am going to respond to this question by answering what I know concerning the issue. I have been informed that the information I give will be used only for the purpose of this study; my identity, the information I give will be treated confidentially. I have also been informed that I can refuse to participate in the study or not to respond to questions I am not interested. Furthermore I have been informed that I can stop responding to the questions at any time in the process.

Based on the above information I agree to participate in the research voluntarily with the hope of contributing (on behalf of one) to the effort of knowing Determinants of HIV testing among tuberculosis patients on DOTS.

Signature: _____ Date: _____

Address of investigator

Name: - Gebi Agero Genemo

Addis Ababa University MPHE student

Cell phone: - +251-911-03-81-53

E.mail:- gebi.agero@yahoo.com, gebishooseenaa@gmail.com

B. Information Form

Dear respondent,

Good morning/afternoon! My name is -----I am interested in learning more about your feelings about determinants of HIV testing among tuberculosis patients. This questionnaire is designed for a research work approved by Addis Ababa University, School of Public Health to be conducted in partial fulfillment of a Masters Degree in Public Health.

In the questionnaire you will be asked some very personal questions that some people find it difficult to answer. Your name will not be written on this questionnaire, and will never be used in connection with any of the information you tell me. You are selected for this survey merely by chance, not done intentionally.

You don't have to answer any questions that you don't want to answer, and you may end to participate in the study at any time you want to. However, your honest answers to these questions will help us better understand what determines HIV testing among TB patients in East Wollega zone. We would greatly appreciate your help in responding to this survey.

The results of the study would hopefully serve as an important input to intervention programs that aim at improving HIV testing among TB patients and increase TB-HIV collaborative activities in the country and East Wollega zone in particular.

The questionnaire will take about 20-30 minutes to answer. I thank you in advance for taking your time to respond to my questions!

Identification:

Name of the town and health institution _____

Name of interviewer _____ signature _____

Date of interview _____

Identification number of the respondent _____

11.2 English version questionnaire

PART I. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

No.	Questions & filters	Coding categories
Q101.	Sex of the respondent?	1. Male 2. Female
Q102.	How old were you at your last birth date?	_____ age in years
Q103.	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 89. Others/specify _____
Q104.	Usual place of residence	1. Urban 2. Rural
Q105.	Distance from nearby health institution	_____ in km
Q106.	Amount of money paid to come to nearby health institution	_____ birr
Q107.	How would you rate the cost it takes to come to this health Institution?	1. High cost 2. Medium cost 3. Low cost
Q108.	To which ethnic group do you belong?	1. Oromo 2. Amhara 3. Tigre 4. Gurage 89. Others (specify) _____
Q109.	Marital status	1. Never married(single) 2. Married 3. Divorced 4. Widowed 5. Others (specify) _____
Q110	Family size of the respondent	_____ number of family size
Q111.	What is the highest level of education you completed?	1. Unable to read and write 2. _____ grades completed 3. College/university diploma and above
Q112.	What is your occupation?	1. Jobless 2. Daily laborer 3. Student 4. Government employ 5. Non government employ 6. Farmer 7. House wife 8. Others (specify) _____

Q113.	What is your average house hold monthly income	_____ birr
Q114	In your opinion which of the following shows your economic status?	1. High 2. Medium 3. Low
Q115.	How long have you lived here?	_____ No. of years

PART II: HIV/TB related knowledge, attitude and stigma

Q201.	Have you ever heard about TB?	1. Yes 2. No
Q202	From where do you hear?	1. Mass media: radio/TV 2. Newspapers/magazines 3. Parents/relatives 4. Dramas 5. Peer educators 6. Health institutions and hospitals 89. Others (specify) _____
Q203	Have you ever afraid of being infected with TB?	1. Yes 2. No
Q204	Who is at risk of getting TB?	1. The poor 2. Rural people 3. Those who live with TB patients 4. Person with HIV 5. Smokers/alcoholics 89. Others (specify) _____
Q205	From where can some one gets TB?	1. TB patient 2. Health personnel/health unit 3. Polluted air 4. Contaminated water 89. Others (specify) _____
Q206	As a TB patient do you reveal it to others?	1. Yes 2. No
Q207	Type of TB (from patient card)	1. Smear positive Pulmonary TB 2. Smear negative pulmonary TB 3. Extra pulmonary TB
Q208	Previous history of TB	1. Yes 2. No
Q209	Stage of treatment	1. Intensive phase 2. Continuous phase
Q210	Type of TB patient (from patient card)	1. New 2. Relapse 3. Defaulter 4. MDR-TB 5. XDR-TB

		6. Not specified
Q211	What is satisfaction of TB patient with current treatment?	1. Good 2. Moderate 3. Poor 89. Others (specify)
Q212	Have you ever heard of HIV or disease called AIDS?	1. Yes 2. No
Q213	Can a health looking person infected with HIV?	1. Yes 2. No
Q214	Do you think there is relationship between TB and HIV/AIDS?	1. Yes 2. No
Q215	Does TB increase after the era of HIV?	1. Yes 2. No
Q216	Do you think control of HIV/AIDS help in the prevention of TB?	1. Yes 2. No
Q217	Can HIV/AIDS be cured?	1. Yes 2. No
Q218	Can a person get HIV from mosquito bite, which has already fed, on a person with AIDS?	1. Yes 2. No
Q219	Can one get AIDS by sharing a meal with someone who is infected with HIV?	1. Yes 2. No
Q220	Can one get AIDS by shaking hands and by wearing clothes living with HIV/AIDS	1. Yes 2. No
Q221	Does having many sexual partners increase a person's risk of being infected with the HIV/AIDS virus?	1. Yes 2. No
Q222	Can a pregnant mother who is infected with HIV or AIDS transmit the virus to her unborn child?	1. Yes 2. No
Q223	Have you had sex in the past 12 months?	1. Yes 2. No
Q224	With whom you have had sex at that time?	1. Regular partner/wife 2. Non regular partner 3. Commercial sex worker 88. Others (specify)
Q225	Have you used condom during your past 30 days sexual activity?	1. Yes 2. No
Q226	With what frequency did you and all of your regular partner(s) use a condom during the past 12 months?	1. Every time 2. Almost every time 3. Some times 4. Never 89. No response
Q227	Can people protect themselves	1. Yes

	from HIV, the virus that causes AIDS, by using a condom correctly every time they have sex?	2. No 88. Don't know 89. No response
Q228	Can a woman with HIV/AIDS transmit the virus to her newborn child through breast-feeding?	1. Yes 2. No 88. Don't know 89. No response
Q229	Once infected with HIV virus, can a person infect others for the rest of his/her life?	1. Yes 2. No 88. Don't know 89. No response
Q230	Have you ever drunk alcohols like Tella, Tej, Beer, local alcohols?	1. Yes 2. No
Q231	How frequently do you take alcohol?	1. Daily 2. Once a weak 3. More than once a weak
Q232	Do you smoke Cigarette?	1. Yes 2. No
Q233	Do you chew 'chat'?	1. Yes 2. No

Part III. HIV testing and factors associated with accepting the test

Q301	Have you heard of voluntary HIV counseling and testing?	1. Yes 2. No 88. Don't know 99. No response
Q302	Where do you get this information?	1. Health workers/facility 2. Mass media 3. Friends 4. Neighbors 88. Others (specify)
Q303	Do you know where to get voluntary HIV counseling and testing?	1. Yes 2. No 88. Don't know 99. No response
Q304	Do you agree that VCT is important?	1. Yes 2. No 88. Don't know 99. No response
Q305	Is there benefit of being tested for HIV?	1. Yes 2. No
Q306	Have you ever tested for HIV? If No skip to Q314	1. Yes 2. No
Q307	Test result (HIV sero status from patient card)	1. Positive 2. Negative 3. Not received

Q308	Have you take your test result?	1. Yes 2. No
Q309	How many times have you ever tested?	_____ number of times the person tested
Q310	Who initiates the testing process?	1. My self 2. Health worker 3. Friends 3. Others (specify)
Q311	Have you received pretest counseling?	1. Yes 2. No
Q312	How long it takes to take test result?	_____ length of time(in hours/days/months)
Q313	Have you received post test counseling?	1. Yes 2. No
Q314	Is it possible in your community for someone to get a confidential test to find out if they are infected with HIV? By confidential I mean that no one will know the result if you don't want them to know it.	1. Yes 2. No 88. Don't know 99. No response
Q315	If a VCT (Voluntary counseling and testing) service is available to you in your area will you be willing to use it?	1. Yes 2. No 88. Don't know 99. No response
Q316	If your answer for question No.315 is no why don't you use it?	1. Not sure of the confidentiality 2. Afraid of AIDS stigma 3. Don't want to know the result 88. Don't know 99. No response
Q317	Which way you prefer to obtain the HIV test result?	1. Face to face verbally 2. Telephone 3. Secretive letter 4. Relative or partner 88. Others (specify)
Q318	Whom do you prefer to offer you HIV testing?	1. Medical doctors 2. Nurses 3. Health officers89. Others(specify)
Q319	If someone knowing you and you know him is providing VCT would you be tested?	1. Yes 2. No
Q320	Is VCT service present at your nearby health institution?	1. Yes 2. No
Q321	If your answer to Q321 is no how long will it takes to go there?	_____ length of time/hours/days

Q322	How it costs you to go to a VCT center?	_____ amount of many paid
Q323	How do you rate this cost?	1. High 2. Low 3. Medium
Q324	Do you accept if VCT service is provided house to house?	1. Yes 2. No
Q325	Do you think people living with HIV/AIDS should be quarantined?	1. Yes 2. No
Q326	Would you be willing to share a meal with a person you knew had HIV/AIDS?	1. Yes 2. No
Q327	Would you say you feel afraid of them	1. Yes 2. No
Q328	People with AIDS should be legally separated from others to protect public health.	1. Strongly agree 2. Agree 3. Indifferent 4. Disagree 5. Strongly disagree
Q329	The names of people with AIDS should be made public so that others can avoid them	1. Strongly agree 2. Agree 3. Indifferent 4. Disagree 5. Strongly disagree
Q330	Suppose you had working place where one of the men working with you had HIV, would you be willing to work with him or her in the same work place?	1. Yes 2. No
Q331	If relative of yours become ill with the HIV, the virus that causes AIDS, would you be willing to care for them in your house hold?	1. Yes 2. No

11.3 Focus group discussion topic guide

1. Introduction

The participants will be asked to introduce themselves to the rest of the group.

2. Warm up questions

The participants will share their experiences or knowledge about AIDS

1. Tell us what is HIV/AIDS?
2. Tell us how people get HIV/AIDS?

Probes

1. Would you explain further?
2. Would you give me an example?
3. Has anyone else had similar experiences?
4. Is there any think else?

3. HIV testing program

The participants will be asked about Voluntary HIV counselling and Testing (VCT) service.

1. What do you know about testing for HIV/AIDS?
2. What do you know about testing and counselling for HIV/AIDS?
3. What are the benefits and the harms of VCT?
4. Who does people decline HIV testing and counselling?
5. What makes people not to use HIV testing?
6. Is location of people from health institution associated with HIV testing?
7. To whom do you think people comply to accept HIV testing and counselling?
8. Is there any cultural and religious practices that could be used to promote VCT?
9. Do you intend to use VCT service in the near future? Why? Why not?
10. Do you have the intention ask your partner for VCT? Why? Why not?

4. Types and Methods of VCT for HIV

Participants will share a little bit about how the service of VCT should be delivered to meet the demand of their community?

1. What organizations or where do you think appropriate to give such service?
2. Whom (what type of people) do you think appropriate to give such service?
3. Which way do you think more preferable to get the test result?

Example: Face to face, Telephone, Secret letter, etc.. Why?

4. After giving a sample for testing , when do you think preferable to hear the test result?

Example: Same-day, Next-day, Two to Three weeks later.

5. Recommendations

After sorrow discussion of the above points, participants will be asked what other things could be done to make this a better acceptable program.

What recommendations or suggestions would you make on a VCT program or other related program?

1. What do the rest of you think?
2. Would you explain further?
3. Would you give me an example?
4. Is there anything else?

We would like you to thank each of you for your time and we do appreciate all your comments.

Participants will be asked if there is anything missed or to add before finishing up this session?

11.4 Afan Oromo questionnaire

A. Unkaa waliigaltee

Ani mallattoo kiyya armaan gaditti kanan kaaye namoonni qoo'annoo kana geggeessaa jiran faayidaa qoo'annoo kana ifa naa godhaniiru akkasumas gaaffii beekuu fi na ilaallatu akkan deebisuuf ifa naa godhaniiru. Mata dureen qoo'annoo kanaas haalota/rakoowwan namootni dhukkuba daranyoo sombaa wajjiin jiraatan akka qorannoo dhiigaa HIV hin goone taasisan qorachuu ta'u isaa natti himameera. Kana malees odeeffannoon ani keennu qoo'annaa kana qofaaf akka itti fayyadaman, icciitiin akka ta'u natti himameera. Gaaffii fi deebii keessatti hirmaachuu fi hirmaachuu dhiisuu akkan danda'u, gaaffii deebisuuf hin barbaadne akkan irra darbuu danda'us natti himameera. Yeroon barbaadettis gaaffii gidduutti dhiisuuf mirga akkan qabu naaf ibsameera.

Odeeffannoo armaan olii irratti hunda'uudhaan, qoo'annoo kana keessatti feedhii kiyyaan qoo'annoo mata dureen isaa haalota/rakoowwan namootni dhukkuba daranyoo sombaa wajjiin jiraatan akka qorannoo dhiigaa hin goone taasisan jedhu irratti hirmaachuuf walii galuu koo mallattoo kootiin nan mirkaneessa.

Mallattoo _____

Guyyaa _____

Guca Gaafataan guutamu

Maqaa magaalaa/dhaabbata fayyaa _____

Maqaa gaafataa _____ Mallattoo _____

Maqaa too'ataa _____ Mallattoo _____

Lakkoofsa eenyummaa gaafatamaa _____

YUNIIVERSIITII ADDIS ABABAATTI, KOLLEJII SAAYINSII FAYYAA, MANA BARUMSAA FAYYAA HAWASAATTI GAAFFILEE HAALOTA/RAKOOWWAN NAMOOTNI DHUKKUBA DARANYOO SOMBAA WAJJIIN JIRAATAN AKKA QORANNOO DHIIGAA HIN GOONE TAASISAN IRRATTI TA'UUF GAAFFIWWAN QOPHAA'AN

A. Unka odeeffannoo

Nagaa bultanii/ooltanii! Maqaan kiyya _____ jedhama. Nuti qoo'annoo haalota/rakoowwan namootni dhukkuba daranyoo sombaa wajjiin jiraatan akka qorannoo dhiigaa hin goone taasisan Yuniiversiitii Finfinneetiin geggeeffamaa jiru keessatti miseensa yoommuu tanu, amma dhaabbata fayyaa kana keessatti haalota/rakoowwan namootni dhukkuba daranyoo sombaa wajjiin jiraatan akka qorannoo dhiigaa hin goone taasisan irratti qo'annoo gaggeessa jirra. Isin immoo qoo'annoo kana keessatti akka hirmaattaniif filamtaniittu; gaaffii tokko tokko nuti isin gaafannuuf deebii nuuf kennitu jennee abdiin guddaa qabna. Wanti nuti isin hubachiisuu barbaannu deebiin isin nuuf deebistan/kennitan icciitiin kan eegamu ta'a. Maqaa keessanii fi bakka jireenya keessanii nutti himuun isin irraa hin barbaachisu. Kana malees mirga guutuu qoo'annaa kana keessatti hirmaachuu fi hirmaachuu dhiisuu, gaaffii isin hin ilaallanne irra darbuu, akkasumas gaaffii fi deebii itti fufuu yoo hin barbaanne ta'e gidduutti dhaabuuf mirga guutuu qabdu. Gaaffiin tokko tokko waa'ee jireenya dhuunfaa keessanii waan ilaallatuuf deebisuuf ulfaataa ta'u ni danda'a Haata'u malee galmaan ga'umsa kaayyoo qorannoo kanaa fi fooyya'insa qorannoo dhiigaa namoota dhukkuba daranyoo sombaa wajjiin jiraatan kan naannoofii magaalaa kana keessa jiraniif muuxannoon keessan baay'ee barbaachisaa fi kan bu'aa olaanaa qabudha. Gaaffii fi deebiin kun tilmaamaan daqiiqaa 30-40 fudhata. Gaaffii gaafattan qabduu?

Baay'ee galatoomaa!

Qo'annaa kana keessatti hirmaachuuf fedha ni qabdaa?

Eeyyee

lakki

Deebiin keessan 'Eeyyee' yoo ta'e gara gaaffii fi deebii koottan darba.

Afan Oromo questionnaire

KUTAA 1^{FFAA}: GAAFFILEE DHIMMA DINAGDEE FI HAWAASUMMAATIIN WAL QABATAN

No.	Questions & filters	Coding categories
Q101.	Saala?	1. Dhalaa 2. Dhiira
Q102.	Umriin kee meeqa?	Waggaa _____
Q103.	Amantaa hordoftu	1. Ortodooksii 2. Protestaantii 3. Musliima 4. Kaatolikii 89. Kan biro(ibsi) _____
Q104.	Iddoo jireenyaa	1. Magaalaa 2. Baadiyyaa
Q105.	Iddoo dhalootaa oromiyaadhaan ala yoo ta'e	Naannoo itti dhalate _____
Q106.	Manni keessan dhaabbata fayyaa irraa hagam fagaata?	Fageenya KM _____
Q107.	Qarshii meeqa kafaltee hamma dhaabbata fayyaa kanaa dhufte?	qarshii _____
Q108.	Kafaltii hamma asitti kafaltee dhufte kana akkamitti madaalta?	1. Kafaltii guddaa 2. Kafaltii giddu galeessa 3. Kafaltii gadaanaa
Q109.	Qomoon (sanyiin) kee maali?	1. Oromoo 2. Amaara 3. Tigiree 4. Guraage 89. Kan biroo (ibsi) _____
Q110.	Haala fuudhaa/heerumaa	1. Kan hin fuune/hin heerumne 2. Kan fuudhe/fuute 3. Kan hike/hiikte 4. Kan haati/abbaan manaa jalaa du'e/duute
Q111.	Baayina maatii	lakkofsa maatii _____
Q112.	Sadarkaa barumsaa olaanaa xumurte?	1. Barreessuu/dubbisuu kan hin dandeenye 2. kutaa xumure/te _____ 3. Kolleejii/Universiitii fi isaa ol
Q113.	Hojiin kee maaliidha?	1. Hojii kan hin qabne 2. Hojjataa guyyaa 3. Barataa 4. Hojjataa mootummaa 5. Hojjataa dhaabbata miti mootummaa 6. Qotee bulaa 7. Haadha warraa

		8. Kan biroo (ibsi)_____
Q114.	Ji'ati galiin jiddu galeessaa kee meeqa?	qarshii_____
Q115.	Akka ilaacha keeti galiin kee kan itti aanan keessaa isa kamitti ramadama?	1. Olaanaa 2. Giddu galeessa 3. Gadaanaa
Q116.	Yeroo hammamiif as jiraate?	Waggaa/ji'a _____

KUTAA 2^{FFAA} : HIV/TB ilaalchisee beekumsa, ilaalchaa fi qoodiinsa

Q201.	Waa'ee daranyoo sombaa dhageesse beektaa?	1. Eeyyee 2. Lakkii
Q202	Gaaffii lakkoofsa 201f deebiin kee Eeyee yoo ta'e. Eessaa dhageesse?	1. Raadiyoo/television 2. Baruulee/gazexaa 3. Maatii/fira irraa 4. Beeksisa irraa 5. Diraamaa irraa 6. Dhaabbata fayyaa 89.Kan biroo (caqasi)_____
Q203	Dhukkuba daranyoo sombaatiin ni qaabama jettee sodaattee beektaa?	1. Eeyee 2. Lakkii
Q204	Dhukkuba daranyoo sombaatiif kan saaxilame eenyuudha?	1. Hiyyeessa (Harka qalleeyyii) 2. Warra baadiyaa jiraatan 3. Warrota namoota daranyoo sombaatiin qabaman wajjiin jiraatan 4. Namoota dhukkuba HIV wajjiin jiraatan 5. Warrota xuuxanii fi dhugan 89. Kan biroo (caqasi)_____
Q205	Daranyoon sombaa eessaa nama qaba?	1. Dhukkubsata daranyoo sombaa irraa 2. Hojjataa fayyaa/dhaabbata fayyaa 3. Qilleensa faalame irraa 4. Bishaan faalame irraa 89. Kan biro (ibsi)_____
Q206	Akka dhukkubsataa daranyoo sombaa taate nama biraatti ni himtaa?	1. Eeyyee 2. Lakkii
Q207	Gosa daranyoo sombaa (kaardii dhukkubsataa irraa)	1. Smear positive Pulmonary TB 2. Smear negative pulmonary TB 3. Extra pulmonary TB
Q208	Kana dura daranyoo sombaan qabamtee beektaa?	1. Eeyyee 2. Lakki
Q209	Stage of treatment (from patient card)	1. Intensive phase 2. Continuous phase
Q210	Type of TB patient (from patient	1. New

	card)	<ol style="list-style-type: none"> 2. Relapse 3. Defaulter 4. MDR-TB 5. XDR-TB 6. Not specified
Q210	Yaalii amma siif kennamaa jiru kana akkamitti ilaalta (maal fakkata)?	<ol style="list-style-type: none"> 1. Gaariidha 2. Giddugaleessa 3. Gad-aanaadha 89. Kan biroo (caqasi)
Q211	Waa'ee dhukkuba HIV/AIDS dhageessee beektaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q212	Namni fayyaa fakkatu dhukkuba HIV qabaachuu danda'aa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q213	Dhukkubni daranyoo sombaa fi HIV/AIDS waliti dhufeenya qabu jettee yaadaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q214	Dhukkubni daranyoo sombaa erga Eedsiin dhufe booda ni dabale jettee yaadaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q215	Dhubbuba HIV/AIDS ittisuun daranyoo sombaa ni ittisa jettee yaadaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q216	Dhukkuba HIV/AIDS fayyuun ni danda'amaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q217	Bookeen busaa dhiiga dhukkubsata HIV/AIDS xuuxxe, dhukkuba kana nama biraatti dabarsuu dandeessii?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakki
Q218	Dhukkubsata HIV/AIDS wajjiin nyaachuun Eed sii nama qabsiisa jettee yaadaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q219	Dhukkubsataa HIV/AIDS wajjiin nyaata nyaachuu, harka fudhuu fi uffata isaa uffachuun dhibee kana namatti dabarsaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q220	Michuu baayyee qabaachuun carra namni tokko dhukkuba HIV/AIDS tiin qabamuu ni dabala jettee yaadaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q221	Dubartiin dhukkuba HIV/AIDS tiin qabamte vaayirasii kana daaa'ima garaa ishee keessa jirutti dabarsuu dandeessii?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii
Q222	Ji'oota darban 12 keessatti wal-qunnamtii saalaa raawwatee beektaa?	<ol style="list-style-type: none"> 1. Eeyyee 2. Lakkii

Q223	Yoo deebiin kee Gaaffii.222 eeyyee ta'e eentu wajiin wal-qunnamtii saalaa raawwate?	1. Hiriyyaa/haadha/abbaa manaa 2. Hiriyyaa kan hin taane 3. Dubartii mana bunaa 89. Kan biroo (caqasi)
Q224	Wal-qunnamtii guyyaa 30 darbe raawwate irratti kondomii fayyadantee beektaa?	1. Eeyyee 2. Lakkii
Q225	Atii fi hiriyaan kee ji'oota 12 darban keessatti haala kamiin kondomitti fayyadamaa turtan?	1. Yeroo hundumaa 2. Yeroo baayyee 3. Darbee darbee 4. Fayyadamnee hin beeknu
Q226	Namootni kondomitti yeroo hundaa fi seeraan yoo fayyadaman vayirasii HIV kan dhukkuba AIDS nama qabsiisu irraa of eeguu danda'uu?	1. Eeyyee 2. Lakki i
Q227	Dubartiin vaayirasii HIV qabdu tokko daa'ima ishee harma hoosisuudhaan vaayirasii kana itti dabarsuu dandeessii?	1. Eeyyee 2. Lakkii
Q228	Namni yeroo tokko vaayirasii HIV/AIDS qabamee jireenyaa isaa guutuu vaayirasii kana nama birootti dabarsuu danda'aa?	1. Eeyyee 2. Lakki
Q229	Dhugaatiiwwan kanneen akka farshoo, daadhii fi araqee dhugdee beektaa?	1. Eeyyee 2. Lakki
Q230	Dhugaatiiwwan kanneen haala kamiin dhugda?	1. Guyyaa hundumaa 2. Torbaanitti yeroo tokko 3. Torbaanitti yeroo tokkoo ol
Q231	Sigaaraa (tamboo) ni xuuxxaa?	1. Eeyyee 2. Lakki
Q232	Caatii ni qamaataa?	1. Eeyyee 2. Lakki

Part III. Qorannoo dhiigaa HIV/AIDS ilaalchisee

Q301	Waa'ee qorannoo dhiigaa fedhii irratti bundaa'ee dhageessee beektaa?	1. Eeyyee 2. Lakki
Q302	Yoo deebiin kee Gaaffii 301f eeyyee ta'e odeeffannoo kana eessaa dhageesse?	1. Dhaabbata fayyaa/hojjataa fayyaa irraa 2. Dhaabbata sab-qunnamtii irraa 3. Hiriyoota irraa 4. Ollaarraa 89. Kan biroo (caqasi)
Q303	Qorannoon dhiigaa fedhii irratti hundaa'e eessaa argachuun akka	1. Eeyyee 2. Lakkii

	danda'amu ni beektaa?	
Q304	Qorannoon dhiigaa fedhii irratti hundaa'e gaaariidha jettee yaadaa?	1. Eeyyee 2. Lakkii
Q305	Qorannoo dhiigaa HIV gochuun faayidaa qaba jettee yaadaa?	1. Eeyyee 2. Lakkii
Q306	Qorannoo dhigaa HIV gootee beektaa? Deebiin lakkii taanaan gara gaaffii Q314 tti darbi	1. Eeyyee 2. Lakkii
Q307	Firii qorannoo dhiigaa kee dhageessertaa (fudhateerta)?	1. Eeyyee 2. Lakkii
Q308	Firii qorannoo dhiigaa (HIV sero status)	1. Poozatiivii 2. Negaatiivii 3. Firii hin fudhanne
Q309	Qorannoo dhiigaa yeroo meeqa taasifteerta?	Yeroo _____
Q310	Qorannoo dhiigaa akka taasiftu eenyutu si kakkase?	1. Ofuma koo 2. Hojjataa fayyaa 4. Hiriyoota koo 5. Abbaa manaa/haadha warraa 89. kan biroo (ibsi) _____
Q311	Qorannoo dhiigaa osoo hin taasisin gorsa fudhateerta?	1. Eeyyee 2. Lakki
Q312	Firii qorannoo dhiigaa fudhachuudhaaf yeroo hammam sitti fudhate?	Dherina yeroo saa'aa/guyyaa/ji'a _____
Q313	Qorannoo dhiigaa booda gorsa fudhateerta?	1. Eeyyee 2. Lakki
Q314	Qorannoo dhiigaa iccitiidhaan naannoo keessanitti argachuun ni danda'amaa	1. Eeyyee 2. Lakki
Q315	Qorannoon dhiigaa fedhii irratti hundaa'e osoo naannoo keessan jiratee itti fayyadamtaa?	1. Eeyyee 2. Lakki
Q316	Deebiin kee gaaffii 315 lakki yoo ta'e maaliif itti hin fayyadamtu?	1. Iciti isaatti waan hin amannef 2. Qoodiinsa HIV sodaadhee 3. Firii qorannoo waan dhagahuu hin barbaannef 89. kan biroo (caqasi) _____
Q317	Karaa kamiin qorannoo firii dhiigaa fudhachuu barbaadda?	1. Fuulaan dhihaadhee 2. Bilbilaan 3. Xalayaa dhoksaatiin 4. Karaa firaatiin/maatiitiin 89. Kan biroo (ibsi) _____
Q318	Qorannoo dhiigaa eenyu akka siif godhu barbaadda?	1. Haakima (Dr) 2. Narsii 3. Qondaala fayyaa 89. kan biroo (caqasi) _____

Q319	Hojjataan fayyaa ati bektu/si beeku qorannoo dhiigaa kan kennu osoo ta'ee qorannoo dhiigaa ni gootaa?	1. Eeyyee 2. Lakki
Q320	Qorannoon dhiigaa HIV dhaabbata fayyaa sitti dhihaatuttu ni argamaa?	1. Eeyyee 2. Lakki
Q321	Deebiin kee gaafii 321 lakki yoo ta'e hamma dhaabbata faayya qorannoo dhiigaa kennutti dhufudhaaf hammam sitti fudhata?	Dherina yeroo sitti fudhatu daqiiqaa/saa'aa/guyyaa _____
Q322	Qarshii meeqa kafaltee hamma dhaabbata fayyaa sanatti deemte?	Hamma qarshii kafalamee _____
Q323	Qarshii kafalte kana akkamitti madaalta?	1. Baayyee guddaa 2. Giddu galeessa 3. Gadaanaa
Q324	Qorannoon dhiigaa fedhii irratti hundaa'e manaa manatti osoo kennamee ni qoratamtaa?	1. Eeyyee 2. Lakki
Q325	Namootni dhukkuba HIV/AIDS wajjiin jiraatan namoota biro irraa adda bahanii jiraatuu qabu jettee yaaddaa?	1. Eeyyee 2. Lakki
Q326	Nama dhukkuba HIV/AIDS qabaachuu iss beektu wajjiin nyata ni nyaattaa?	1. Eeyyee 2. Lakkii
Q327	Namoota dhukkuba HIV wajjiin jiraatan nio sodaattaa?	1. Eeyyee 2. Lakkii
Q328	Ummatta ballaa dhukkuba irraa bittisuudhaaf namootni dhukkuba HIV wajjiin jiraatan seeraan namoota, biro irraa addaan bahanii jiraatuu qabu	1. Cimsee itti amana 2. Itti amana 3. Bilisa 4. Itti hin amanu 5. Cimsee itti hin amanu
Q339	Maqaan namoota dhukkuba HIV wajjiin jiraatanii saaxila bahuu qaba!	1. Cimsee itti amana 2. Itti amana 3. Bilisa 4. Itti hin amanu 5. Cimsee itti hin amanu
Q330	Akka carraa ta'ee osoo iddoo ati dalagaa dalagdutti namni dhukkuba HIV qabu jiraatee, nama sana duukaa/wajjiin dalagaa ni dalagdaa?	1. Eeyyee 2. Lakkii
Q331	Firri kee akka tasaa vaayirasii HIV odoo qabaatee deeggarsa ni gootaafii?	1. Eeyyee 2. Lakki

11.5 Afan Oromo Focus group discussion topic guide

1. Seensa

Hirmaatonni akka wal baran taasisuu.

2. Gaaffii seensaa/kaka'umsaa

Hirmaatonni akka muuxannoo/beekumsa HIV/AIDS irratti qaban waliif hiran taasisuu

5. HIV/AIDS maal akka ta'e mee nutti himaa(HIV/AIDSn maaliidha?)!

6. Namootni akkamitti dhukuba HIV/AIDStiin qabamu?

Ibsa dabalataa gaafachuu

1. Bal'innaan naaf ibsuu dandeessuu/saa?

2. Fakeenya naaf kennuu dandeessuu/ssaa?

3. Yaada wal fakkaataa kan qabu jiraa?

4. Wanti biroo kan hafe yoo jiraate?

7. Qorannoo dhiigaa HIV

Hirmaatonni waa'ee qorannoo dhiigaa fedhii irratti hundaa'ee ni gaafatamu.

1. Waa'ee qorannoo dhiigaa maal beektu?

2. Waa'ee gorsaa fi qorannoo dhiigaa maal beektu?

3. Faayidaa fi miidhaan qorannoo dhiigaa maaliidha?

4. Namootni qorannoo dhiigaa HIV/AIDS taasisan namoota akkamiiti?

5. Rakkoon namootni qorannoo dhiigaa akka hin taasifne taasisan maaliidha?

6. Is fageenyi namootni dhabbata fayyaa irraa qaban qorannoo dhiigaa HIV waliin wal-qabataa?

7. Adaa fi amantii waa'ee qorannoo HIV dhoorku jiraa?

8. Qorannoo dhiigaa gara fulduratti itti fayyadamtaa?maaliif?maaliif hin fayyadamtu?

8. Gosootaa fi haala qorannoon dhiigaa itti gaggeefamu

Hirmaatonni walgahichaa haala qorannoo dhigaa irratti ni mari'atu?

1. Dhaabbilee akkamiitu/iddoo kamitti qorannoon dhiigaa gaggeeffamuu qaba?

2. Eenyutu (namoota akkamiitu) qorannoo dhiigaa laachuu qaba?

3. Karaa kamiin qorannoo dhiigaa fudhchuu wayya?

Fakkeenyaaf: fuulaan dhihaatanii, Karaa bilbilaan, Xalayaa dhoksaatiin, ...Maaliif?

4. Erga dhiiga kennitan booda firii isaa yoom fudhachuu barbaaddu?

Example: Guyyuma sana, Guyyaa lammaffaa, Torbaan lamaa fi sadi booda.

5. Yaada

Mariin dheeraan erga qabxiilee armaan olii iratti gaggeeffame booda, hirmaattonni maaltu sirraa'uu akka qabu ni gaafatamu

Tajaajilli qorannoo dhiigaa HIV akka sirratuuf yaadni/ maaltu ta'uu qaba jettanii yaaddu?

1. Warri kuun hoo maal jettu?
2. Sirritti naaf ibsaa mee?
3. Fakeenya naaf laachuu dandeessuu/ssaa?
4. Wanti hafe jiraa?

Baayyee galatoomaa!!!

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in this or another university and all the resources of materials used for the thesis have been fully acknowledged.

Name: Gebi Agero Genemo (BSc)

Signature: _____ Date _____

This thesis work has been submitted for the examination with my approval as a university advisor.

Name: Alemayehu Worku (PhD)

Signature: _____ Date _____