

# Assessment of Tracing Family Members of HIV Positive People for HIV Testing and Associated Factors among ART Clinic Attendants at Felege Hiwot Referral Hospital, Northwest Ethiopia

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## Abstract

**Background:** When there is a person in the household infected with HIV the family members will be at risk of horizontal and vertical transmission of the virus to partners and children respectively. Therefore, family members of HIV positive individuals should be aware of their status through HIV testing to take prevention measures and if they were already infected should get HIV care and treatment service early before the disease progresses to AIDS case. Research conducted in different countries about tracing family members for HIV test showed high acceptance rate (>90%) with high prevalence and interventional study in 26 health centers in Ethiopia showed success of tracing 59% of family members for HIV test. **Objective:** The objective of the study is assessing HIV testing status of family members of patients attending ART clinic in Felege Hiwot Referral Hospital, Amhara region, Ethiopia and to identify associated factors for tracing families for HIV testing. **Methodology:** Institution based cross-sectional quantitative study was conducted at Bahir Dar, Felege Hiwot Referral Hospital from September 12 - October 15, 2013. Data was collected after 10% of the sample pretested and correction made on the structured questionnaire. Systematic random sampling technique was used considering the daily patient flow, duration of the study period and inclusion and exclusion criteria. The collected data was entered into Epi info software and analysis was carried out using SPSS version 16. Logistic Regression was carried out to identify variable which have association. **Result:** A total of 422 clients were involved to the study whose mean age was 36.0 ±8.5 years and among them 64.6% were females. Participants of the study responded for 1308 of their family members' status and 971(74.2%) of the family members were tested for HIV. Of which 290 were spouses, 559 were children and 122 were other individuals living with index cases in the same household. Participants living near the hospital traced their family members 3.49 (95% CI 1.296-9.426) times more likely than participants living far away from the health hospital and participants who had discussion about HIV with their families traced 2.81(95% CI 1.035-7.638) times for HIV testing more likely than participants who did not discuss about HIV status and testing. **Conclusion and Recommendation:** Tracing family members was high among ART clients in the hospital and many children and adults were traced and tested for HIV. However, there were many untested partners, children and other individuals living with index cases and tracing and testing should be strengthened and assessing family members HIV status and advices on prevention measures and treatments should be routinely carried out in order to control HIV transmission and save the lives of people at risk.

**Keywords:** ART, HIV, Tracing

## ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
ART	Antiretroviral Therapy
COR	Crude Odds Ratio
FHRH	Felege Hiwot Referral Hospital
HAART	Highly Active Antiretroviral Therapy
HAPCO	HIV AIDS Prevention and Control Office
HIV	Human immunodeficiency Virus
MOH	Ministry of Health
OR	Odds Ratio
PITC	Provider-initiative Testing and Counseling
PLWHA	People Living With HIV AIDS
SD	Standard Deviation
UOG	University of Gondar
VCT	Voluntary Counseling and Testing

## 1. Introduction

When there is a person in the household infected with HIV virus the members of the family will be at risk of infection. If the father is infected with the virus his wife will be at risk of horizontal transmission. Children, who get birth from infected parents, will be at high risk of vertical transmission unless they get prevention of mother-to-child transmission treatment. Meta-analysis on the effect of HIV counseling and testing pointed out the provision of effective means of secondary prevention for HIV-positive individuals. HIV positive individuals who underwent HIV counseling and testing increased their safer sex behaviors and reduced their risk behaviors, thereby decreasing their likelihood of infecting others or becoming re-infected with HIV or STDs (1). Therefore, testing for HIV is not only important for the family members but also for the society in general in reducing new infections.

Globally, there are 33.3 million adults and children living with HIV and in Sub-Saharan African countries 22.5 million adults and children are living with HIV which is 67.6% of the world total. In 2009 alone, there were an estimated 2.6 million people newly infected with HIV and 1.8 million of them were in Sub-Saharan Africa. In the same year, AIDS-related deaths among adults and children were 1.8 million and that of Sub-Saharan Africa was 1.3 million, which is 72% of the global total (2).

The prevalence and incidence of HIV in developing countries was also high and takes the higher share of the global disease burden. At the end of 2009, 36% (about 5.2 million) of 15 million people in need in low- and middle-income countries were receiving antiretroviral therapy. In Sub-Saharan Africa, nearly 37% of people eligible for treatment were able to access life-saving medicines in the same year (2). The vast majority of people newly infected with HIV in sub-Saharan Africa are infected during unprotected heterosexual intercourse (including paid sex) and onward transmission of HIV to newborns and breastfed babies.

Ethiopia is one of Sub-Saharan African countries with high incidence and prevalence. HIV/AIDS estimates and projections in Ethiopia indicated that in 2012 adult prevalence will reach 1.3% and there will be 759,268 HIV positive population. New infection during the same year will be 20,158 and adult HIV incidence 0.03% with annual AIDS death of 41,444. The total positive people in need of ART will reach 398,686(3).

The situation of HIV/AIDS in the Amhara region is one of the worst in the country with persistently high prevalence particularly of the urban estimates. The region prevalence was estimated at 2.8% in 2009 and 2.9% in 2010(4). Currently people living with HIV/AIDS in the region are estimated 379,096. Even though, there is no any study showing reasons for this great variation between the national and the regional figures, there are some speculations like high rate of poverty, drought and famine, illiteracy, unemployment, rural to urban migration, silence about HIV/AIDS among family members, harmful traditional practices like early marriage and female genital mutilation, and societal practices like polygamy that are highly prevalent in the region to be the possible causes.

Awareness to ones' HIV status and partners' HIV status is crucial for couples having unprotected sex. In sub-Saharan Africa nearly 80% of HIV-infected adults are unaware of their HIV status and more than 90% are unaware of their partners' status (5, 6). In Kenya, nearly 500,000 untested HIV-uninfected people live with an HIV-infected partner (7). This shows us that many people are living at high HIV virus transmission and it is an urgent public health matter. Therefore, tracing family members of infected individuals for HIV testing and counseling is gateway for HIV prevention and early accessing of treatment to their families and need to be done routinely in health facilities.

Most persons are late for HIV test not only in developing countries but also in developed countries like USA. A study done on eleven US states and cities on HIV testing patterns revealed that persons were tested late in their course of HIV infection: 36% were tested for HIV within 2 months and 51% within 1 year of their AIDS diagnosis(8). In the same study, persons primarily sought HIV testing because of illness (58%); other reasons included being in a known risk group (13%) and having had a known HIV-infected sex partner (8%).

Family members of HIV positive individuals are therefore in need of HIV testing and counseling in order to prevent the transmission and if they are already infected they should be in HIV care and treatment as early as possible. Testing for HIV is delayed in most people in fear of stigma attached with positive result and will not be tested unless they are admitted and offered PITC. At late stage of disease burden it will be AIDS case and many will die.

To the level of my knowledge, in our country there is no family-focused approach of health care system. In the case of HIV, families are the immediate persons at risk of transmission of the virus. Therefore, family centered disease prevention is essential to get as many individuals as possible for testing and enrolling in care and treatment for positives and would be able to save many lives.

There is no home-based voluntary counseling and testing for HIV in our country to test families of infected individuals. However, these infected individuals come to health facilities to get care and treatment and this will be a good opportunity to trace their families. If we encourage and counsel ART clients to disclose their status to their families and be able to tell their families the importance of testing for HIV and advantages of care and treatment services; many accept this offering as revealed on studies done in different countries (9,10,11).

This research focuses on assessing the practice of family member tracing for HIV testing and counseling using ART clinic attendees at health facility. By doing this ART clients save the death of their family members and associated social and economic problems caused due to HIV/AIDS.

## 1.1 Literature Review

### 1.1.1 Prevalence of Tracing Family Members

Institution based enrolling family members of HIV positive individuals to bring their family members for HIV service showed a significant outcome in Ethiopia. An interventional study was conducted by Management Science for Health (American International NGO) in family member tracing in 2009 by registering 5, 878 nuclear family members of HIV patients and clients of 26 health centers in Amhara regional state using Adherence Counselors to encourage them participating in care. They found that 3, 454 (59%) tested for HIV and 1,219 were found to be positive (35% excluding index case). Of 767 tested spouses, 468(61%) were found to be positive (12). This shows us that family focused approach for HIV care and treatment has a positive feedback among patients and their families and could easily be involved with the system if requested to do so.

Home-based ART care is another option to reach families of infected individuals. An intervention approach of home-based VCT to household members of people initiating ART, clients of AIDS support organization, was conducted at rural Uganda. In this study, among 2373 household members identified 2348 (99%) accepted VCT (11). HIV prevalence among household members was 7.5% and 74% had never been previously tested, and 39% of these were clinically eligible for ART. Of the 120 spouses of ART patients that were tested for HIV, 52 (43%) were HIV negative, and of these, 99% had not been previously tested.

Provider-initiated HIV testing and counseling (PIHTC) is an important intervention to increase HIV testing in Low-and Middle-income countries (13). Offering PITC for clients admitted to hospital is a routine practice in many health facilities. Offering testing and counseling to all family members of admitted patients is another strategy. In the study of western Nigeria, they offered and tested family members of all admitted patients and succeeded to test 88% (162/184) family members of all admitted patients(9). Of these 151(93.2%) were tested for the first time and most (82.1%) had taken post-test counseling. The overall HIV prevalence was 12.3% (20/162) and the prevalence among family members of HIV positive and HIV negative patients was 15.6% (14/90) and 8.3%(6/72) respectively.

Family members counseling and testing had high acceptance in facility level provision of the service among clients who visit the health institution and we can get large number of positive who need immediate HIV care and ART treatment. In Uganda, hospital based routine HIV counseling and testing among patients had 98% acceptance with a prevalence of 25% and counseling and testing for family members patients has 93% acceptance with 20% prevalence (10). This shows us that there is high acceptance rate of testing of family members and the prevalence is also high.

The magnitude of adults and children of infected individuals who were at risk of HIV infection could be identified at facility based tracing. A cross-sectional survey study was carried out in urban ART clinic in Blantyre, Malawi about HIV testing coverage of family members of 832 adult antiretroviral therapy patients and they found that 81.2% of 1223 children and 37.7% of 488 spouses of adult ART patients were reportedly not HIV tested (14). In this study wives of male patients were significantly less frequently HIV tested than husbands of female patients (53.0% vs. 72.4%,  $p < 0.0001$ ). Children under the age of 8 years (adjusted odds ratios [aOR] 2.76), children of female patients (aOR 2.53) and of patients whose partner had been HIV tested (aOR 2.87) were significantly more likely to have been tested for HIV.

Family-focused approach of HIV care and treatment pays attention to the need of families and household members and it is best approach to reach family members in need of HIV services. Family-focused model research was conducted in implementing mother-to-child transmission-plus program in Abidjan, côte d'Ivoire with 605 infected pregnant or postpartum women and 582 HIV-exposed infants (15). Of their 568 male partners reported alive, 52% were aware of their wife's HIV status and 30% were tested for HIV; 53% of these tested partners were found to be HIV-infected and 78% enrolled into the program. Overall only 10% of the women enrolled together with their infected partner. In this study disclosure of HIV status by women to their partners and family members was found the barrier for HIV testing.

Another retrospective study in family model of HIV care and treatment was conducted in Lumumba Health Centre in Kisumu, Kenya (16). They took 285 random sample of patients, including the charts of 87 male and 198 female patients among 5802 adult patients and 725 family members at risk were identified, 241(33%) partners and 484(67%) children. This study found that among partners identified, 176 (73%) were tested, with 125 (71%) of them HIV positive, and among children identified, 276 (57%) were tested, with 50 (18%) of them HIV positive. Among HIV positive family members, 154 (88%) were enrolled in care, including 111(89%) partners of HIV-positive partners and 43 (86%) children of HIV-positive children.

### 1.1.2 Factors associated with Family Members Tracing

Voluntary HIV counseling and testing (VCT) is one of the key strategies in the HIV/AIDS prevention and

control programs in Ethiopia. A study among men in Ethiopia revealed that 21.9% of urban men and 2.6% of rural men had ever tested for HIV through VCT and having no stigma towards people living with HIV/AIDS was found to be strongly and positively associated with VCT utilization in both urban and rural strata (17).

Contact tracing of known infective is also an effective method to get individuals at risk regards to universal HIV testing/treatment. A research carried out in Cuba using a mathematical model (18) which considers two levels of detection of HIV-infective through contact tracing of known infective found that contact tracing for detection of HIV infective could be suitably used to remedy inadequacies in a universal HIV testing program when designing timely and effective intervention measures.

Discussion about HIV testing is strongly associated with individuals planning for testing. A research conducted in Ndola, Zambia on the demand of voluntary counseling and testing(VCT) among adolescents found that discussing HIV testing with family members was associated with planning to test (odds ratio[OR]=6.1, 95% confidence interval[CI]=2.24-16.58) and VCT discussions with sex partners (OR=3.64; 95%ci=1.13-11.71) and with friends (OR = 2.61; 95% CI=1.34-5.08) were also associated with HIV testing plans (19). Therefore, making discussion with family members and sex partners about HIV testing increases the chance of planning for test and getting tested.

Partner notification about HIV status is very important mechanism to disclose the seropositive status and then to bring them for HIV service. A study on critical re-examination of partner notification(20) reported five general findings regards to partner notification: (1) many, if not most, HIV-infected individuals will cooperate in notifying at least some of their sex partners of exposure to HIV; (2) sex partners are generally receptive to being notified and will seek HIV testing; (3) patient referral is probably not as effective as provider referral in reaching sex partners; (4) sex partners often are unaware of or misunderstand their HIV risks; and (5) sex partners frequently have high rates of HIV infection.

Disclosing HIV positive status to a sexual partner is association with knowing the partners' HIV status. A study done in southwest Ethiopia found that among 705 HIV positive clients, vast majority (94.5%) disclosed their result to at least one person and 90.8% disclosed to their current main partner and most (80.3%) reported that their partners reacted supportively to disclosure of HIV status (21). In this study disclosure of HIV results to a sexual partner was associated with knowing the partner's HIV status, advanced disease stage, low negative self-image, residing in the same house with partner, and discussion about HIV testing prior to seeking services.

The literatures on family member tracing focused on parents or spouses mainly and children related issues like: the number of children in a family, for how many of them the index cases disclosed their status and told about HIV counseling and testing and the refusal rate were not dealt with in detail. The other issue is the difference in socio-cultural settings of the areas these researches were done on family testing and the absence of family centered care in our country.

### **1.3 Justification of the study**

HIV testing and counseling allows individuals to determine their HIV status and family members of positive individuals serve as a gateway for HIV prevention, accessing treatment, providing care and support for infected family members as early as possible. ART clinic attendants are means to reach their partners, children and other household members who are at risk of HIV infection and disease transmission both horizontally and vertically.

Family focused HIV prevention saves the lives of many adults and children who were infected already and have risk of being infected in the future since they have different kinds of contacts with index cases knowingly and unknowingly living in the same household with lower economic condition, poor educational and cultural practices.

There is a practice of counseling ART clinic attendants to bring their family members for HIV counseling and testing in many of health facilities. However, it was not assessed before that how many family members of patients were tested and getting the service available at the health institutions. This research is important to identify the magnitude of undiagnosed family members and associated factors that could contribute for tracing and providing HIV care and ART treatment service for those in need.

## **2. Objectives**

### **2.1 General Objective**

To assess the level of tracing family members of ART clinic attendants for HIV testing and associated factors in Bahir Dar, November 2013

### **2.2 Specific objectives**

1. To determine the proportion of traced family members of ART clinic attendants for HIV testing
2. To identify factors affecting tracing family members of ART clients for HIV testing

### 3. Methodology

#### 3.1 Study Design

Institution based quantitative cross-sectional study design was carried out.

#### 3.2 Study Area

The study was conducted at Bahir Dar town Felege Hiwot Referral Hospital which has high patient load (cumulative on HIV care-15058, cumulative started ART-10340, Currently on ART treatment-6017 and currently on PRE-ART care-817, Adults and Children, September 2012 report of the hospital) and one of the earliest ART treatment sites (started ART service since 1994 EC) in the region and there was a practice of tracing family members of ART clinic attendants at the hospital for more than two years.

#### 3.3 Source Population and Study population

Source Population: All HIV/AIDS patients who are on HIV care and following at FHRH.

Study Population: Adult HIV positive clients who have follow up at Felege Hiwot Referral Hospital and visited ART clinic during the study period.

Inclusion Criteria: ART clinic attendants both on PRE-ART and ART whose age is greater than 18 years.

Exclusion Criteria: those who have visited the hospital and on care and treatment but severely ill, with mental illness, unable to hear and speak, those whose partner is already included in the study and not living alone (should have spouse, children or other person living with).

#### 3.4 Sample size and sampling technique

Sample Size: The sample size was calculated using single population formula with 95% level of confidence. There was no similar research done on this topic in similar setting in Ethiopia and I have taken population proportion of 50% and 5% precision level.

Using single population proportion formula for sample size calculation:

$$n = \frac{z_{\alpha/2}^2 p(1-p)}{w^2}$$

Where n is the sample size to be taken

$Z_{\alpha/2} = 1.96$ , upper percentile of standard normal distribution

$P = 0.5$ , population proportion and

$w = 0.05$  which is precision level, then

$$n = (1.96)^2 * (0.5 * 0.5) / (0.05)^2$$

$$n = 384$$

Adding 10% for non-response rate which is 38.4 (rounded to 38), the sample size became 422.

Sampling Procedure: The number of patients who visit the clinic every day was 120 on average and there were 6 nurses working at the clinic who collected the data. There were 24 working days from September 12 to October 15, 2013 and to 17 clients should be interviewed daily to get a total of 422 sample size. Therefore, each of the nurses interview almost 3 clients daily. Systematic random sampling technique was applied to select 3 out of 20 clients visiting daily for one data collector. To get 3 out of 20 one will be selected randomly and with the interval of every 6(20/3) clients the next two will be chosen considering inclusion and exclusion criteria.

#### 3.5 Variables of the Study

Dependent variables:

Tracing of family members (at least one) for HIV testing by ART clients

Independent variables:

1. Socio-demographic characteristics (Age, Marital status, Sex, Educational status, ethnicity, Religion, Occupation, Number of family members)
2. Disclosure status to family members
3. Duration of living together with partner
4. Time from first HIV diagnosis
5. Duration on ART treatment
6. Discussion with family members about HIV testing
7. Counseling by health professionals to bring family members
8. Index patient awareness about tracing family members
9. Substance abuse (Chat, alcohol use, smoking, and others)

## 10. Health status of the index patient (clinical stage, functional status, CD4 count)

### 3.6 Operational Definitions:

**Family member:** people living in the household, consisting of spouse/sexual partner, children and other members connected with them either biologically (in blood) or by choice.

**Other family members:** children or adults living in the same household other than spouses and own children of participants

**Tracing:** bringing individuals (partner or children) to the hospital for HIV testing and care and treatment service.

**Index cases:** HIV Positive Patients who fulfill inclusion exclusion criteria and included in the study.

**Living in and around Bahir Dar:** those patients living in Bahir Dar town and rural Kebeles of Bahir Dar town.

**Spouses living together:** spouses alive, not separated or divorced but living in the same household with participants at the study period.

### 3.7 Data collection Procedures:

Data was collected with interviewer using pretested semi-structured questionnaire by the nurses working at ART clinic of the hospital who were trained and well-oriented about the research objective and the data collection procedures.

Data Quality checking: The quality of data was checked for its completeness and consistence taking five percent of the daily collected data from each data collector with the patient information on the charts using medical record number. Data collection process was closely supervised with the investigator.

### 3.8 Data Processing and Analysis

Data was entered into Epi info and then exported to SPSS for analysis. Binary Logistic Regression was carried out to identify factors which have significant association with the dependent variable and the strength of association was measured using Odds ratio with 95% confidence interval (CI).

## 4. Ethical Considerations

Ethical clearance was obtained from Institute of Research Board of UOG. Letter of permission to conduct the research was obtained from Amhara Regional Laboratory and Researches Center and submitted to Feleke Hoot Referral Hospital. Interview was conducted after written consent was taken from each person explaining about the importance of research and its non-harming effect upon them. All the information was kept confidential by rejecting identifier variables like name in the questionnaire and keeping the collected data in a locked shelf and giving password for the softcopy data on the computer.

## 5. Results

Four hundred twenty two adult patients who had follow up at ART clinic were interviewed giving 100% response rate. The mean age of the respondents was  $36.0 \pm 8.5$  years. Among respondents 271 (64.2%) were females and 151(35.8%) were males. Most of the respondents 394 (93.4%) were orthodox Christians, from Amhara ethnicity 407 (96.4%) and 322 (76.3%) were clients living in Bahir Dar. From participants 399 (94.8%) were on ART (86.4% on ART in the whole population) and of them 376 (85.3%) were taking ART for more than a year. (See Table 1)

### 5.1 Tracing Family Members for HIV Testing

Family members of participants were spouses, children and other persons living together in the household. From 422 participants, 1308 number of family members' testing status was known and reported. Of which 971(74.2%) were tested and 245 (25.8%) were untested family members (Table 2). The overall prevalence in the household for spouses and children was 30.0% (266 positive out of 877 tested and known results).

Among spouses of respondents 290 (72.7%) were tested for HIV and 288 spouses test result was known and of which 206(71.5%) found positive and 82(28.5%) found negative. There were 277 spouses who were alive and living together with participants of which 260 (93.9%) were tested and 179 (71.6%) were tested positive and 71(28.5%) were discordant couples (HIV negative) (see Table 3).

Among participants who have children, 369 responded whether they brought their children for HIV testing and 303 (82.1%) said that they brought at least one of their children for HIV test and 66 (17.9%) participants brought none of their children.

There were a total of 779 children found from participants and 220(28.2%) were not tested and 559 (71.8%) children were tested for HIV. There were 60(10.7%) children tested positive and 89.3% were tested negative. From positive children 57(95%) were enrolled in HIV care and 49 (86%) started ART treatment. From participants who had children 156(41.7%) disclosed their status to at least one of their children.

## 5.2 Determinant factors for tracing at least one family member

Association of independent variables with outcome variable-tracing at least one family member was analyzed based on bi-variate analysis and five variables were found significant. Distance from the area of health institution (FHRH), year since diagnosis, year since ART started, means of first test for HIV, and making discussion with family member about testing were found having significant association for tracing at least one family member and their Adjusted Odds Ratio was calculated after these five variables entered together in binary logistic regression model (See Table 5).

Multivariate analysis in binary logistic regression found that three out of five variables had significantly associated with the outcome variable. The first variable was living near the hospital was 3.49 (95% CI 1.296-9.426) times more likely to trace at least one family member than participants living away from the hospital.

The second associated factor was means of first HIV test. Clients who tested and came to HIV care service tested and referred from VCT trace their family members 2.94(1.002-8.619) times more likely than participants who were tested and referred from PITC.

The other most important and significant factor was making discussion about HIV testing. Participants who made discussion with family members about HIV testing trace 2.81(95% CI 1.035-7.638) times more likely than participants who had not discussion with family members (See Table 5).

## 6. Discussion

Family focused HIV prevention, care and treatment is very important since family members living with infected individuals are at high risk of horizontal and vertical transmission of the virus to their spouses and children respectively. Therefore tracing family members for HIV testing through clients at ART clinic is one mechanism to counsel the families and bring them to the service.

This study identified that significant number of participants traced at least one family member for HIV testing (74.2%) with high prevalence (30%). This tracing family member is closer to family members tested in Kenya health center 62% (16). However lower than family member counseling and testing among hospitalized patients in Uganda which had 93% acceptance (10) and the interventional study done in Nigeria that among family members of admitted patients 93.2% tested for HIV and it was their first time test (9). This can be due to the difference in the study methods that patients were admitted in both Uganda and Nigeria cases and their family might be cooperative to accept the request while in this study most patients were in working status.

From alive and living together partners of index cases 6.1% (17/277) were not tested. In contrast to this study, untested partners in the study of Kenya health center was 27% (16) and with similar study in urban Malawi partners not tested was 37.7%(3) and partner not tested at PMTCT program in Abidjan, cote d'ivoire was 70% (15). This variation in partner testing is due to the difference in socio demographic characteristics, prevalence of HIV and also in this study counseling of patients to bring their family members is a routine practice.

The number of children of participants untested for HIV was 28.2% of 779 children and it is much lower than the study of Malawi and cote d'Ivoire which had 81.2% and 89.2% untested children respectively(14,15). This might be due to the practice of children tracing at FHRH was coordinated and routinely done than others and there is also time gap between studies.

Statistical analysis was carried out to identify the factors which have association for family members tracing. After entering variables which had significant association in bivariate analysis in to binary logistic regression model, three variables found to be independently associated factors for tracing of at least one family member.

Participants who were living nearby the hospital (Bahir Dar) trace their family members 3.49 (95% CI 1.296-9.426) times more likely than participants living far away from the health institution or hospital. Distance is a proximal factor which is barrier for getting health service. This can be explained with economic problem for transportation to bring family members for HIV testing and it needs motivation to do so. Those who are living near the hospital are population who are urbanized because the hospital is found at the regional capital and would have information about HIV risk and transmission through media than those living in rural areas where the literacy and awareness is limited. Distance from testing site was also explained as barrier for HIV testing in the study of Uganda which counted 8% from overall barriers for testing (11).

Participants who referred to HIV care tested through voluntary testing trace 2.94(1.002-8.619) times more likely their family members than those who came tested through provider initiative testing and counseling. VCT is client-initiated testing for HIV and these participants who are self-initiated are able to bring other family members for testing because they had more time for counseling (30-40 minutes), they came for preventive HIV acquisition through risk assessment, risk reduction and testing than who tested first by health care providers who came to the health facility once after they become sick and visited the health institution looking for treatment for the disease they had and health workers counsel them for HIV testing. These clients had

limited time for counseling (10-20 minutes) with inappropriate space setting to counsel and provider recommends test as standard medical practice and they were not curious and aware of HIV and ready for testing. Therefore they could not be well aware of the infection, its transmission to other persons including family members. A study conducted in Lusaka, Zambia shows us that there is a significant variation between the characteristics of VCT and PITC clients that PITC clients less likely to have secondary or tertiary education and have lower odds of initiating treatment within four weeks of enrollment in to HIV care and lower odds of retention in care at six months (22).

The last associated factor for bringing family members for HIV testing was making discussion with family members about HIV testing which was 2.81(95% CI 1.035-7.638) times more likely to trace family members than participants who did not discuss about testing. Discussion about testing is a pre-condition for tracing family members for testing. Study in Ndola, Zambia showed the association of discussing HIV testing family members with planning for test (OR=6.1, 95% CI 2.24-16.58). Those who discussed about testing would have plan for testing (19).

## 7. Conclusion

This study revealed that bringing family member, at least one family member, for HIV testing was high at this hospital with high prevalence. However there were untested partners, children and other individuals living with the HIV patients. Family-focused approach is a valuable strategy for identifying HIV-positive persons who might not present otherwise. Participants living far away from the hospital, patients who first tested and referred to HIV care from PITC (visited the health facility getting some kind of disease) and participants who did not have discussion with family members about HIV testing were found factors that hinder counselling and testing with respect to their comparison factors.

## 8. Recommendation

This study showed that significant number of family members of HIV positive individuals were brought and tested for HIV. However, counseling and advising to the HIV patients to bring their family member for HIV testing should be as one of the day to day services of ART clinic health workers. The study also found out many untested children, partners and individuals who were living with HIV patients and they should know their HIV status and get treatment at the earliest possible time. Therefore, ART clients of the hospital can serve as means to bring those people who are at risk for HIV infection and using this opportunity we can contribute to reduce mortality due to HIV/AIDS.

The barriers for HIV testing which are psychological, social and economic problems should be addressed through different mechanisms and HIV care services should be accessible to children, partners and household members of infected individuals who are at risk. Therefore, the practice of counseling and advising HIV patients to bring their families for counseling and testing, during their follow up visits to the health institutions, should be one of the regular services of the health institutions which are providing the HIV care and treatment services.

## 9. Strengths of the Study

The study showed the proportion of family members tested in detail through tracing and also factors for tracing family members for HIV testing.

## 10. Limitations of the Study

- The study used verbal reporting of respondents about family member tracing for HIV which may cause interviewers and social desirability bias
- Household prevalence including other family members could not be calculated since their test result was not recorded
- Qualitative study was not used to supplement the quantitative study

## References

- 1 Lance S. Weinhardt, MS, Michael P. Carey, PhD, Blair T Johnson, PhD, and Nicole L. Bickham, MS. Effects of HIV Counseling and Testing on Sexual Risk Behavior: A Meta-Analytic Review of Published Research, 1985-1997. *American Journal of Public Health*. Sep 199 89:9
- 2 UNAIDS REPORT ON THE GLOBAL AIDS EPIDEMIC 2010.
- 3 HIV/AIDS Estimates and Projections in Ethiopia, 2011-2016. National AIDS Resource Center. 04 July 2012.
- 4 Amhara HIV/AIDS Prevention and Control coordination Office report from BoFED 2009
- 5 Bunnell R, Opio A, Musinguzi J, et al. HIV transmission risk behavior among HIV-infected adults in Uganda: results of a nationally representative survey. *AIDS* 2008; 22: 617-24.
- 5 WHO/UNAIDS/UNICEF. Towards universal access: scaling up priority. HIV/AIDS interventions in the



- health sector. April, 2007.
- 6 NASCOP. AIDS in Kenya, 7th edn. Nairobi: National AIDS and STI Control Programme, Ministry of Health, 2005.
  - 7 Wortley, Pascale M.; Chu, Susan Y.; Diaz, Theresa; et al. HIV testing patterns: where, why, and when were persons with AIDS tested for HIV? OFFICIAL JOURNAL OF THE INTERNATIONAL AIDS SOCIETY. 9:5.
  - 8 Olusegun Busari, Adedayo Adeyemi, Olufemi Desalu, et al Routine HIV Testing of Family Members of Hospitalized Patients in Nigeria. Preventive Medicine Bulletin. 2012; 11(2): 199-204.
  - 9 Wanyenze RK, Nawavvu C, Namale AS, et al. Acceptability of routine HIV counselling and testing, and HIV seroprevalence in Ugandan hospitals. Bull World Health Organ. 2008 Apr;86(4):302-9
  - 10 Willy A. Were, MBChB, MPH, Jonathan H. Mermin, MD MPH, Nafuna Wamai, MBChB, MPH, et al. Undiagnosed HIV Infection and Couple HIV Discordance Among Household Members of HIV-Infected People Receiving Antiretroviral Therapy in Uganda. J Acquir Immune Defic Syndr & 43:1, September 2006.
  - 11 Melese Muluken, Kassa Tiruneh, Kassie Yonas, et al. HIV Positivity and Discordance Rate among Nuclear Families of HIV Patients Enrolled in Care at Health Centers in Ethiopia. <http://www.msh.org/resource-center/AIDS-2010-Ethiopia-HIV-positivity-and-discordance-rate.cfm>
  - 12 Kennedy CE, Fonner VA, Sweat MD, et al. Provider-Initiated HIV Testing and Counseling in Low- and Middle-Income Countries: A Systematic Review. PMID: 22752501
  - 13 D. Cohen, M. Lungu & J.J. van Oosterhout. HIV testing coverage of family members of adult antiretroviral therapy patients in Malawi. Journal of AIDS Care. 22:11, 1346-1349. First published: 14 July 2010.
  - 14 Besigin Tonwe-Gold, Didier Koumavi Ekouevi, Clarisse Amani-Bosse, et al. Implementing family-focused HIV care and treatment: the first 2 years' experience of the mother-to-child transmission-plus program in Abidjan, Côte d'Ivoire. Tropical Medicine International Health 2009 Feb, 14(2):204-12
  - 15 Jayne Lewis Kulzer, Jeremy A Penner, Reson Marima, et al. Family model of HIV care and treatment: a retrospective study in Kenya. Journal of the international AIDS society 2012, 15:8 <http://www.jiasociety.org/content/15/1/8>
  - 16 Leta TH, Syndøy IF, Fylkesnes K. Factors affecting voluntary HIV counseling and testing among men in Ethiopia: a cross-sectional survey.
  - 17 Ying-Hen Hsieh, Yun-Shih Wang, Hector de Arazoza and Rachid Lounes. Modeling secondary level of HIV contact tracing: its impact on HIV intervention in Cuba. BMC Infectious Diseases 2010, 10:194
  - 18 Denison JA, McCauley AP, Dunnett-Dagg WA, et al. HIV testing among adolescents in Ndola, Zambia: how individual, relational, and environmental factors relate to demand. AIDS Education Prevention 2009 Aug;21(4):314-24.
  - 19 West GR and Stark KA. Partner notification for HIV prevention: a critical reexamination. AIDS Education Prevention. 1997 Jun;9(3 Suppl):68-78.
  - 20 Kebede Deribe, Kifle Woldemichael, Mekitie Wondafrash et al. Disclosure experience and associated factors among HIV positive men and women clinical service users in southwest Ethiopia. BioMedCentral Public Health 2008, 8:81.
  - 21 Stephanie M Topp, Michelle S Li, Julien M Chipukuma, et al. Does provider-initiated counseling and testing (PITC) strengthen early diagnosis and treatment initiation? Results from an analysis of an urban cohort of HIV-positive patients in Lusaka, Zambia. PMCID: PMC3494161

Table 1. Socio-demographic characteristics and health status of ART clinic attendants at FHRH, Bahir Dar (N=422), December, 2013

Characteristics	Frequency	Percent (%)
<b>Sex</b>		
Male	151	35.8
Female	271	64.2
<b>Age group</b>		
18-25	36	8.5
26-35	187	44.3
36-45	146	34.6
>45	53	12.6
<b>Marital Status</b>		
Married	267	63.3
Divorced/separated	74	17.5
Widowed	81	19.2
<b>Residence</b>		
Near the hospital	322	76.3
Far from the hospital	100	23.7
<b>Educational Status</b>		
Illiterate	146	34.6
Able to read and write	54	12.8
Elementary	63	14.9
High school	97	23.0
Diploma and above	62	14.7
<b>Occupation</b>		
Employed in Gov't & Private organization	109	25.8
Daily Laborer	105	24.9
Private work	122	28.9
House wives	71	16.8
Unemployed	15	3.6
<b>Functional status</b>		
Ambulatory	24	5.7
Bedridden	3	0.7
Working	351	83.2
Unrecorded	44	10.4
<b>WHO Stage</b>		
Asymptomatic (stage 1&2)	146	34.7
Symptomatic (stage 3&4)	274	65.3
<b>Year since HIV diagnosis</b>		
Below 1 year	63	15.1
Above 1 year	354	84.9
<b>Treatment stage</b>		
PRE ART	22	5.2
On ART	399	94.8
<b>Recent cd4 count</b>		
Below 250	125	29.6
Above 250	296	70.1

Table 2: Family members Tracing status of ART clinic attendants at FHRH, Bahir Dar, (N=1308), December, 2013.

Family Member	Frequency	Tested	% Tested	% Not Tested	% Total
Spouse	399	290	72.7	27.3	100.0
Children	779	559	71.8	28.2	100.0
Other family members	130	122	93.8	6.2	100.0
<b>Total</b>	<b>1308</b>	<b>971</b>			

Table 3: Spouse Tracing status of ART clinic attendants at FHRH, Bahir Dar, (N=422), December, 2013

Characteristics	Frequency	Percent
<b>Testing status of Spouses (N=422)</b>		
Tested	290	68.7
Not tested	109	25.8
Not recorded	23	5.5
<b>Spouses tested and result known(N=288)</b>		
Tested Positive	206	71.5
Tested Negative	82	28.5

Table 5: Bivariate analysis for all variables and multivariate analysis for significant variables for tracing at least one family member (COR-Crude Odds Ratio, AOR-Adjusted Odds Ratio)

Characteristics	Traced		COR (95% CI)	AOR (95% CI)
	Yes	No		
<b>Sex</b>				
Male	139(32.9%)	12(2.8%)	0.490(0.211-1.139)	
Female	260(61.6%)	11(2.6%)	1	
<b>Residence</b>				
In Bahir Dar	311(73.7%)	11(2.6%)	3.855(1.645-9.035)	3.495(1.296-9.426)
Out of Bahir Dar	88(20.9%)	12(2.8%)	1	1
<b>Age group</b>				
18-25	35(8.3%)	1(0.2%)	3.646(0.408-32.602)	
26-35	179(42.4%)	8(1.9%)	2.331(0.729-7.449)	
36-45	137(32.5%)	9(2.1%)	1.586(0.506-4.966)	
Above 45	48(11.4%)	5(1.2%)	1	
<b>Educational Status</b>				
Illiterate	135(32.0%)	11(2.6%)	0.201(0.025-1.593)	
Able to read & write	50(11.8%)	4(0.9%)	0.205(0.022-1.892)	
Elementary Education	62(14.7%)	1(0.2%)	1.016(0.062-16.618)	
High School Education	91(21.6%)	6(1.4%)	0.249(0.029-2.117)	
Diploma and above	61(14.5%)	1(0.2%)	1	
<b>Marital Status</b>				
Married	257(60.9%)	10(2.4%)	2.431(0.894-6.608)	
Divorced/ Separated	68(16.1%)	6(1.4%)	1.072(0.343-3.349)	
Widowed	74(17.5%)	7(1.7%)	1	
<b>Substance use (at least one substance)</b>				
No	343(81.3%)	18(4.3%)	1.701(0.607-4.767)	
Yes	56(13.3%)	5(1.2%)	1	
<b>Recent cd4 count</b>				
Below 250	119(28.3%)	6(1.4%)	1.208(0.465-3.141)	
Above 250	279(66.3%)	17(4.0%)	1	
<b>Year since Diagnosis</b>				
Below 1 year	58(13.8%)	7(1.7%)	0.354(0.138-0.907)	1.348(0.291-6.248)
Above 1 year	339(80.9%)	15(3.6%)	1	1
<b>Participant first tested through</b>				
VCT	198(47.6%)	5(1.2%)	3.216(1.156-8.949)	2.939(1.002-8.619)
PITC	197(47.4%)	16(3.8%)	1	1
<b>Year since ART Started</b>				
Below 1 year	67(16.9%)	11(2.8%)	0.239(0.101-0.564)	0.277(0.067-1.143)
Above 1 year	306(77.3%)	12(3.0%)	1	1
<b>Discussed at least to one family member about testing</b>				
Yes	331(78.8%)	13(3.1%)	3.858(1.623-9.169)	2.811(1.035-7.638)
No	66(15.7%)	10(2.4%)	1	1

## Questionnaire

### Part I. Socio-demographic and health status information

1. Age \_\_\_\_\_ Sex \_\_\_\_\_
2. Residence, Woreda \_\_\_\_\_ Kebele \_\_\_\_\_
3. Recent CD4 count \_\_\_\_\_
4. Clinical WHO stage?  
a) I b) II c) III d) IV
5. Functional status of the client \_\_\_\_\_  
a) Ambulatory b) Bedridden c) Working
6. Marital Status  
a/ Not married but has partner b/ Married c/ Divorced d/ Separated  
e/ Widowed f) Not married and has no partner
7. What is your educational status  
a/ Illiterate b/ Read and Write c/ Elementary education  
d/ High School Education e/ Diploma or above
8. What is your religion?  
a/ Orthodox b/ Protestant c/ Catholic d/ Muslim  
e/ if other, specify \_\_\_\_\_
9. What is your ethnicity?  
a/ Amhara b/ Agew c/ Tigrie d/ Oromo e/ if other  
specify \_\_\_\_\_
10. What is your occupation? \_\_\_\_\_
11. How many are you in the household living together?(including yourself) \_\_\_\_\_
12. If you have children, would you tell us their ages \_\_\_\_\_
13. Is there a family member than spouse and dependent children?  
a. Yes b. No
14. Which of the following substances do you use?  
a. Khat b. Alcohol c. Cigarette d. Hashish and others  
e. None
15. When did you first tested for HIV? \_\_\_\_\_
16. Are you on HAART?  
a. Yes b. No
17. If on HAART, when did you start taking ART? \_\_\_\_\_

### Part II. If the respondent has partner/spouse, answer from Q No. 19-34

18. How long have you lived with your current spouse? \_\_\_\_\_
19. Have you ever discussed about HIV testing with your partner?  
a. Yes b. No
20. Have you disclosed your status to your spouse?  
a. Yes b. No
21. Does your spouse/partner know his/her HIV status?  
a. Yes b. No c. I don't know d. I am not sure
22. If answer is yes for Q No.23, how was he/she tested?  
a. Client initiated b. Health Provider initiated c. Initiated by families  
d. Asked by law e. Other
23. If your spouse/partner is tested, have you contributed for his/her testing?  
a. Yes b. No
24. If your spouse/partner is tested, how long was he/she tested? \_\_\_\_\_
25. If answer is yes for Q No.24, What was his/her HIV test result?  
a. HIV positive b. HIV negative
26. If answer is no for Q No.27 is Negative, was he/she tested again?  
a. Yes b. No
27. If answer to Q No.22 is positive, is he/she linked to ART clinic?  
a. Yes b. No
28. If answer to Q No.23 is yes, is he on ART?  
A. Yes b. No
29. If answer to Q No. 24 is no, have you been counseled to bring him/her for HIV testing in ART clinic?  
a. Yes b. No
30. If your spouse/partner was not tested, have you asked him/her to be tested for HIV?

- a. Yes                      b. No

**Part III. If the respondent has children, answer questions from No.35-41**

31. Have you ever discussed about HIV testing with your children?  
a. Yes                      b. No
32. Have you been counseled by ART clinic staffs to bring your children for HIV testing?  
a. Yes                      b. No
33. Do you have a child tested for HIV?  
a. Yes                      b. No
34. If yes, how many of your children tested? \_\_\_\_\_
35. If you have tested children, how many of them were positive? \_\_\_\_\_
36. If you have positive children, how many were enrolled on HIV care? \_\_\_\_\_
37. How many started ART treatment? \_\_\_\_\_
38. Have you disclosed your status to any of your children?  
a. Yes                      b. No
39. If your answer for Q No42 is yes, tell us their age \_\_\_\_\_
40. Have you brought for HIV testing a family member living with you other than spouse and children?  
a. Yes                      b. No