

PREVALENCE AND INCIDENCE OF HIV-1 INFECTION,
KNOWLEDGE AND WILLINGNESS
TO PARTICIPATE IN HIV VACCINE TRIAL
AMONG RESIDENTS OF WONJI SHOA SUGAR ESTATE

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CDC	Centers for Disease Control
ELISA	Enzyme Linked Immuno Assay
ENARP	Ethio Netherlands AIDS Research Project
HIV	Human Immunodeficiency Virus
STD	Sexually Transmitted Disease
S/ EIA	Sensitive Enzyme Linked Immuno Assay
LS/ EIA	Less Sensitive Enzyme Linked Immuno Assay
STARHS	Serologic Test Algorithm for Recent HIV Seroconverters
UNAIDS	Joint United Nations Program on HIV/ AIDS
WHO	World Health Organization

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Abstract

Ethiopia is one of the countries most seriously affected by HIV/AIDS in the world. With 2.2 million individuals living with the virus the 2001 estimate of HIV prevalence is 6.6% ranging from 3.7% in the rural to 13.7% in the urban centers.

This cross sectional study is aimed at investigation of the prevalence and incidence of HIV- 1 infection and to assess knowledge and willingness to participate in HIV vaccine trial among residents of Wonji Shoa Sugar Estate. It was conducted in Wonji Shoa Sugar Estate between December 2002 and February 2003. A total of 1998 and 371 randomly selected individuals aged 18-29 participated in the serosurvey and behavioral survey respectively.

Information regarding sociodemographic characteristics, sexual behavior and knowledge on HIV and vaccines was collected using a structured questionnaire. ELISA test was used to determine the prevalence of HIV-1 infection and the BED IgG capture assay was applied to identify recent infections.

The prevalence and incidence of HIV-1 infection was found to be 2.46% and 0.4 per 100 persons respectively. Prevalence of HIV-1 infection was significantly higher among females 3.49% ($P<0.05$) in the age groups 20-24 and 25-29 years (3.57% and 4.83%, $p<0.05$, respectively) among the residents of the two factory villages Wonji (3.58%) and Shoa (3.34%) and among day laborers (3.73%) all with $p<0.05$. There was high knowledge of HIV prevention and low level of misconceptions regarding transmission

but low condom use among those involved in risky sexual behaviors. The majority were also assuming themselves as not being high risk for HIV while they were involved in risky sexual behavior. Despite misconceptions on the uses of vaccines, the majority of the respondents were willing to participate in HIV vaccine trial.

From this study it was concluded that Wonji Shoa Sugar Estate is a low HIV prevalence site with the incidence of HIV infection a bit higher than the existing cohort with adequate knowledge of HIV and few misconceptions regarding transmission of HIV, use of vaccines and remarkable majority willing to participate in HIV vaccine trial. To maintain the prevalence and incidence of HIV-1 infections at a further lower level and conduct HIV vaccine trial a more focused educational intervention is required for the general community with special emphasis on females and the residents of the two factory villages is recommended. The low incidence of HIV-1 infection and the high willingness of participants to enroll in a HIV vaccine trial make Wonji a potential site for Phase I/II vaccine trial.

1. Introduction

The HIV/AIDS epidemic is in its third decade and its spread continues at a frightening pace especially in sub-Saharan Africa claiming millions of lives and tremendous suffering (1)

HIV/AIDS has become a serious problem in Ethiopia with the national adult HIV prevalence of 6.6% and 2.2 million adults and children living with the virus at the end of the year 2001. Urban centers are more affected than rural setups.(2)

Preventive efforts such as intensive sex education including the need to negotiate safe sex and delaying the age at first sex, improved treatment of sexually transmitted infections (STIs), self treatment kits for STIs, social marketing of condoms, including enforcement of 100% condom use in brothels in countries like Thailand, voluntary counseling and testing including same-day results of HIV tests in countries like Uganda, access to HIV prevention campaigns through schools, the mass media and the work place and reduction in visits to sex workers in Thailand, Senegal and Uganda were key factors in lowering HIV infections (3).

As a best public health practice it is mandatory to trace the trajectory of the epidemic for proper planning and evaluation of preventive programmes (4). Comparing the information on HIV prevalence and behaviors that facilitate its spread is essential to build an informative picture of changes over time. (5) Second generation surveillance

encompasses the understanding of diverse biological and behavioral insights, which enhances confidence in trends and allows meaningful explanations of these trends (5,6).

It is believed that two thirds of all new HIV infections worldwide could be eliminated with more effective education and prevention by 2010(7) however with an estimated 14000 new cases of HIV infection occurring daily by the year 2002, a safe, effective and affordable vaccine remains the best long-term hope for bringing global epidemic under control (8).

The HIV vaccine trial efforts so far have demonstrated that the scientific, logistic and ethical challenges of HIV vaccine efficacy trials can be met, given a high level of commitment (8). These trials need intense preparation of well-motivated, informed participants, and a well-characterized cohort with high retention and stable incidence (9,10). Though approximately 70% of worlds HIV positive population lives in sub-Saharan Africa, information on the incidence of HIV-1 infection is scarce in this region.

Very few studies have been done in Ethiopia to estimate the incidence of HIV-1 infection. The cohort studied by the Ethio Netherlands AIDS Research Project (ENARP) at Wonji Shoa Sugar Factory and Akaki textile factories is one among the few cohorts in sub-Saharan Africa. The incidence of HIV in these two cohorts between 1997 -1999 was 0.63 and 0.18 per 100 person years for Akaki and Wonji cohorts respectively (11).

Hence, in order to identify the number of new cases of HIV infection and check whether a community is well suited for a HIV vaccine trial; up-to-date estimation of incidence and firm understanding of the underlying behaviors is mandatory.

This research is intended to estimate the prevalence and incidence of HIV-1 and determine factors associated with HIV infection in this community and also compare the incidence findings from the findings of the cohort. Participants' general knowledge on vaccines and their willingness to participate in HIV vaccine trial is assessed. These key concepts will be of importance in the planning and evaluation of the existing preventive programmes and may be an initial step for a preventive vaccine research in the country.

2. Literature review

2.1. Current situation of the epidemic

The recent UNAIDS/AIDS epidemic update reports that there are 42 million people living with HIV/AIDS worldwide. 38.6 million of these are adults; 19.2 million are women and 3.2 million are children under the age of 15. Five million new infections with HIV occurred in 2002 of which 4.2 million were adults and 2 million of them were women. A total of 3.1 million people died of HIV/AIDS related causes in 2002(12).

In the region of Sub-Saharan Africa an estimated 3.5 million adults and children became infected with HIV during the year 2002, bringing the total number of people in the region living with AIDS to 29.4 million by the end of the year. It is said that the number of people infected during the year was slightly less than the 2000 total of 3.8 million. In this region AIDS deaths in 2002 totaled 2.4 as compared with 2.2 million in 2001. For the moment, overall HIV prevalence, (the regional total of people living with HIV or AIDS) continues to rise because there are still more newly infected individuals joining it each year than there are people leaving it through death (12,13).

Senegal and Uganda are still the only two SSA countries that have successfully controlled HIV/AIDS through vigorous and sustained prevention campaigns, by successfully mobilizing all sectors of society in the fight against HIV/AIDS. Uganda

in particular managed to control a rampant epidemic, which shows that it can be done (1,2).

Ethiopia is among the countries hardest hit by the HIV/AIDS epidemic in sub-Saharan Africa. It is now almost 19 years since the epidemic started in the country. The epidemic has affected a large segment of the society and no region or zone in the country is spared (10, 14) Although HIV prevalence was very low in Ethiopia during the early 1980s, it has been increasing rapidly in the 1990s. Adult HIV prevalence increased from 0.0% in 1984 to 1% in 1989, 3.2% in 1993, 7.4% in 1997 and 7.3 % in 2000. The 2001 estimate of HIV prevalence in Ethiopia is 6.6%, which is less than the prevalence of 7.3 in 2000, which was attributed to the possible stabilization of the epidemic and as a result of more extensive surveillance data (10)

In Ethiopia urban HIV prevalence rates continue to be high at 13.7 percent while HIV prevalence rate for rural areas remain relatively low at 3.7 percent. HIV prevalence for Addis Ababa is estimated from ANC attendees to be 15.6% and that of Nazareth was 18.7%. The number of persons living with HIV/AIDS in 2001 in the country is estimated at 2.2 million, including 2 million adults and 200,000 children and approximately 10 percent of these or 219,400 are full blown AIDS cases. The highest prevalence of HIV is seen in the group 15-24 years of age representing " recent infection". The age and sex distribution of reported AIDS cases shows that about 91 percent infections occur among adults between 15-49 years. Given that the age range

encompasses the most economically productive segment of the population, the epidemic is said to impact negatively on labor productivity (10).

There are few community based prevalence or incidence studies in this country. Studies have shown prevalence rates of 1.5% among the general population in Meskan and Mareko Woreda (15), 3% among students and 0.3% among out of school youth in Addis Ababa (16), 3.8% among male rural army recruits (n= 61913) (7) and 6.1 % among police recruits in Addis Ababa (17). Prevalences of 2.8% and 8.8% have been reported from estate workers and male Wonji factory workers of Wonji Shoa sugar estate respectively in 1996 (18) and 6% in males and 6.9% female adults in Addis Ababa in 1994 (19).

HIV/AIDS is now by far the leading cause of death in sub-Saharan Africa and the fourth biggest global killer (13). It is erasing decades of progress made in extending life expectancy. Life expectancy in sub-Saharan Africa by 2001 was 47 years, when it would have been 62 years without AIDS. The life expectancy in Ethiopia 43 is years while it would be 53 years without AIDS (10, 13). There is growing evidence that as HIV prevalence rates rise, both total and gross national income - gross domestic product, or GDP fail significantly (19, 20). AIDS is also a major threat to food security and nutrition by diminishing the availability of food (due to falling production, and loss of family labor, land, livestock and other assets) and reducing access to food as households have less money (10, 12, 13).

2.2. Measuring the magnitude of the epidemic

Monitoring of the epidemic is important to follow the course of the epidemic, to intervene to prevent its further spread, to plan to minimize its impact, and to understand a certain society's epidemic more in detail (3, 21). Moreover estimating the magnitude of the trajectory of HIV/AIDS epidemic is crucial to plan and evaluate control strategies effectively and to prepare for vaccine efficacy trials. The tradeoffs between alternative interventions and policies must be based on the best possible information about current levels and trends in the epidemic (3, 21).

Simply recording changes in prevalence does not contribute to an understanding of an epidemic. To overcome this, second generation surveillance has become the practice of choice currently. It particularly emphasizes the importance of using behavioral data to inform and explain trends recorded in HIV infection in a population. It advocates the more extensive use of behavioral data in planning and evaluating an appropriate response to HIV (4, 22). Where possible, surveillance systems may need to focus their attention on new infections, where many of the factors that may falsely bring stabilized prevalence do not come in to play (4, 22). As per the principles of the second-generation surveillance it is recommended that behavioral and biological information should be collected from different individuals who represent the same source population. In order to compare the extent to which the tested population and the population questioned about behavior are in fact similar - and to assess systematic

differences between the groups-basic socio-demographic data should be collected from both groups (4).

2.3. HIV-1 incidence best estimate of the epidemic

HIV incidence, the rate of new infections in a defined time period, provides the most useful data for following emerging trends in HIV transmission, identifying new high-risk populations and determining where to focus prevention efforts including HIV vaccine trials (23). Changes in HIV prevalence may or may not reflect trends in incidence; and currently worldwide prevention efforts are focusing on new infections to make major impact on the spread of the epidemic (24, 25). Also data on trends in HIV incidence provide the most direct assessment of prevailing HIV epidemic dynamics and of the effects of ongoing preventive interventions. Knowing the incidence is also important for identifying and selecting appropriate cohorts in preparation for vaccine trials as populations with high incidence are required to conduct phase III vaccine efficacy trials (23-26). Further more because most people infected with HIV experience many years of healthy life followed by relatively rapid deterioration in health eventually leading to death, estimates of current incidence rates can be used to forecast morbidity and mortality caused by HIV infection several years ahead (26).

2.4. Identifying recent HIV infections

The ability to identify the newly HIV infected may provide the opportunity to interrupt transmission through more focused behavioral efforts, early start of treatment and partner notification. (26, 27). Prevalence data may not identify those groups in whom new infections are occurring; hence they are less useful for targeting and evaluating primary prevention efforts (26). Early identification accompanied by appropriate counseling and partner notification, can help to reduce secondary transmission from recently infected individuals to their sex partners (24, 27, 28). Hence the identification of persons with early HIV-1 infection is useful at the population level for estimating incidence, at the clinical level for patient care and at the public health level for focusing and evaluating HIV prevention efforts (28).

Longitudinal and cross-sectional data on HIV-1 prevalence are increasingly available for sub-Saharan African populations; empirical estimates of HIV-1 incidence remain relatively rare (29).

A decline in incidence of HIV-1 infection has been reported from cohorts in Kenya, Uganda and more recently from Wonji and Akaki cohort sites (30, 31, 32). The major reasons given for the decline in incidences were the reduction in risk sexual behavior and STDs, and coordinated prevention efforts in all studies and the accumulation of lower risk participants in the Kenyan cohort of prostitutes (30).

Results from ENARP cohorts Wonji and Akaki have revealed that reduction in incidence was accompanied with reduction in the prevalence of casual sex in the past year, sex with commercial sex workers, history of genital discharge and increase in condom use with the last partner. At Wonji site, the intake prevalence of casual sex, sex with commercial sex workers and history of genital discharge decreased significantly by calendar year between 1997 and 1999. At both sites combined, between the first and the fourth follow-up visits, there was a decline in the proportion of males reporting recent casual sex from 17.5 % to 3.5 %, a decline in sex with CSWs from 11.2% to 0.75%, and in genital discharge from 2.1% to 0.6% ($P= 0.004$). The incidence of HIV-1 infection was $6/952= 0.63$ per 100-person year in Akaki and $2/1125=0.18$ per 100-person year in Wonji. The expected incidence under the steady state assumption was 1.36 and 0.74 per 100 person years in Akaki and Wonji respectively. The decline in casual, sex may not be related to only cohort participation but also to a more general reduction in risky sexual behaviors in the surrounding community (11).

2.5.Advances in Methods of estimating incidence of HIV infection

Follow-up of cohorts of at-risk HIV seronegative individuals is the traditional approach for detecting incident infections which is based on the longitudinal monitoring of seronegative people for sero conversion. This requires repeated HIV testing and recruitment of large number of seronegative volunteers (24,28). However longitudinal cohorts are cumbersome, expensive, may have a recruitment bias and

may not be timely. Risk reduction and behavior change as a result of counseling during recruitment may yield a lower incidence than the actual rate occurring in the cohort population. Furthermore unavoidable loss to follow up may confound the analysis (24, 27, 28). Another approach is estimating incidence from serial cross-sectional sero surveys but results in unavoidable loss to follow up and again it is time consuming (24, 27).

Currently, laboratory based methods have advanced in the detection of recent HIV-1 infection. The first is detection of HIV-1 RNA or p24 antigen in the absence of specific antibody. This test actually detects acute HIV-1 infections, it is expensive, requires obtaining one of only a few commercially available test kits, and is limited in efficiency because it can identify acutely infected individuals only within a 14-22 day period. The short duration makes it difficult to capture enough people in this acute phase. Further more it requires testing a large number of seronegative people repeatedly for the presence of RNA or p24 antigen (24, 33, 34).

The Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS) (also called detuned assay) has been developed and is in use to detect recent HIV-1 infections from a single cross sectional survey. STARHS is based on the fact that antibody titers increase following seroconversion. Those classified as recent infections are estimated to have seroconverted within the last 129 days (Seroconversion duration, 95% CI, 190-149). The problem with the use of subtype B

antigens, typical of most commercial EIAs in the STARHS appears to result in subtype-specific bias (28, 33-39).

Very recently another assay (a modified version of the STARHS called competitive IgG-capture BED-BED-EIA) was discovered. It was devised to detect an increasing proportion of anti-HIV IgG in the serum following sero conversion. It is designed to perform equivalently in different subtypes, including African specimens (subtypes A, D, C). Sero conversion duration of 180 days is set to detect recent infection. Antigen derived from multiple subtypes permitted detection of recent infection among different subtypes with similar dynamics. Its 96-well format allows the use of generic washers and readers. The assay is performed using a specimen dilution of 1/100; as compared to the 1/10,000 dilution required by S/LS assay (STARHS) (24,40).

In view of potential problems associated with longitudinal surveys, it is tempting to consider whether useful estimates of incidence of infection can be estimated from more readily available data on HIV prevalence. This is more beneficial for resource poor and epidemic hit nations like ours and we have used this technique to identify recent infections and estimate incidence of HIV-1 infection in this study.

2.6. Behavioral change as a key to decline in HIV infection

2.6.1 Age at first sex and reported STI.

Modeling of the epidemic with the best available information has shown that unsafe sex is by far the predominant mode of transmission in sub-Saharan Africa (12, 13, 41, 42).

Uganda's success in curtailing the spread of HIV is largely attributed to behavioral change, notably a reduction in the number of individuals' sexual partners and the postponement of sexual debut among young people. Decline in infection rates among young people has been mostly due to the rise in the median age of first intercourse by 2 years from age 15 to 17 in the year 1995 (13). In a number of African countries there is a trend of early sexual initiation: in the late 1980s, between 22% and 64% of unmarried women aged 15-17 years in Kenya, Ghana, Botswana and Liberia reported being sexually active (43). In Ethiopia age at first sex ranges from 12-18 years among high school students in Addis Ababa in 1990, with 70% initiating sex between the ages 14-16 (44). The Demographic and Health Survey-2000 indicated that the median age at first intercourse for women is the median age at marriage, while men become sexually active well before marriage. The median age at first sexual intercourse for man is 20.3 years, three years earlier than the median age at first marriage (45).

Serial prevalence data on STIs from the Addis Ababa have shown a decline in prevalence of syphilis antibodies (TPHA) from 12.3% in 1995 to 6.8% in 2000 (46). Decrease in risk sexual behavior is also currently reported from the cohorts at Wonji and Akaki (11).

2.6.2 Condom use

Since it is not sex itself but unprotected sex that spread HIV in most countries, condom use has been a central intervention strategy for many AIDS programs. Prevention programs need to try to make high quality affordable condoms accessible to anyone who is likely to have sex, preferably at or near the venues where riskier sex is most likely to occur (47). As stated above condoms are key to preventing the spread of HIV/AIDS and sexually transmitted infections, together with sexual abstinence, postponement of sexual debut and mutual fidelity (13, 47). In Kenya increasing condom use from less than 5% in the 1980s to more than 85% in the mid 1990s has reduced the annual incidence of HIV infection from 47% to about 1% in the same period. In Thailand and Cambodia, programmes promoting 100% use of condoms in brothels have successfully reduced HIV transmission in sex workers and their clients as well as the general population (2, 13, 18). The proportion of high school students reporting condom use in Addis Ababa increased from 6.6% in 1990 to 27.7% in 1993. Thirty four percent of college students in Addis Ababa reported condom use in 1993, in Gondar the proportion increased from 24.0% to 45.9% between 1990 and 1996. Trends over time in the availability of condoms are also important indicators of changes in sexual behavior and in Ethiopia there has been a progressive increase in the sale and distribution of condoms since 1990 from a baseline figure of 700 thousand to 41.8 million in 1999 (48).

2.6.3 Knowledge about HIV/AIDS STIs and level of perceived susceptibility of HIV

To change their behavior people need to have some basic knowledge of HIV and be aware to their risk of infection (50). Studies in different parts of the country have shown that adequate knowledge on HIV/AIDS prevention and transmission ranging from 38.1, 40%,65%, in Afar, Addis Ababa and Benshangul regions respectively (51-53). Studies at the start of the cohort in Akaki showed that 97% of participants replied that the main modes of HIV transmission in Ethiopia were sexual and mother to infant. However despite this good knowledge 16% of the male participants reported casual partners in the past year and condom use with casual sex was only 16%. In the same survey individual risk of HIV infection was only 70% among men who had casual partners in the past six months (55). The preliminary report of the recent BSS showed that about 98% of the study population is aware of HIV/AIDS, almost all groups know at least one prevention method, nearly 60% know all three prevention methods and knowledge of prevention methods increases with number of media source for AIDS messages. But misconceptions about HIV/AIDS transmission remain high in almost all groups and regions and are high irrespective of level of knowledge (10).

Own-risk perception is very low in almost all target groups, most respondents who had unprotected sex with non-marital partners do not feel that they are at risk and

despite a high level of knowledge, a significant proportion of the population, particularly the young is at high risk of infection (10).

2.6.4 Voluntary Counseling and Testing (VCT)

VCT as a proven preventive strategy has become central to prevention, it helps people to learn about how HIV is transmitted, to practice safer sex, to get an HIV test and, depending on the result, take steps to avoid becoming infected or infecting others (13, 47). A reduction of about 35% in unprotected sexual intercourse has been shown in a recent randomized trial of individuals and couples assigned in the VCT group in Kenya. Trinidad and Tobago, and Tanzania compared with a 13% reduction in the group that received basic health information (13, 56). Various levels of willingness to have VCT are reported from different corners of the country and factors associated with willingness to have VCT include ever having sex and , correct knowledge of HIV transmission (38, 40, 42)

2.7 HIV vaccine trial

2.7.1 Importance

More than 20 years after AIDS was first reported, the HIV pandemic continues to spread, with an estimated 14, 000 new cases of HIV infection occurring daily. A safe, effective and affordable vaccine remains the best long-term hope for bringing the global epidemic under control (12, 57). An AIDS vaccine is urgently needed to

improve the effectiveness of prevention programmes in countries at all stages of the epidemic (58).

Vaccines stimulate the body's immune system to provide protection against infection of disease. Vaccines against HIV are being developed, and they are in various stages of clinical trial but at present none have proven effective. An HIV vaccine contains only harmless bits of the virus and cannot cause a person to become infected with HIV (59). Immunization of those most likely to spread infection to others could break the transmission chain in the population through reducing the number of secondary infection. In addition a vaccine would be an important tool for people with low-risk behavior like many monogamous women who are primarily exposed to the risk of HIV infection through the behavior of their partners or spouses (60).

Vaccine research is a long process that begins with basic laboratory research and product development, including animal experiments, mostly performed in academic laboratories (60). Then the candidate vaccines will be tested on healthy human volunteers through sequential phases. In phase I and II trials, the safety of the candidate vaccines and their ability to induce immune responses specific to HIV is checked. These trials are done among small numbers of low risk healthy volunteers (50-200 per trial). Depending of the results obtained, candidate vaccines can proceed to large-scale phase III trials, to obtain definitive information about their efficacy in inducing protection against HIV infection of AIDS. For scientific reasons, phase III

trials are done in populations with a high incidence of HIV infection, involving thousands of volunteers (12, 57, 59).

Since 1987, more than 30 HIV candidate vaccines have been tested in approximately 60 phase I/II trials, involving more than 10,000 healthy volunteers. The results have confirmed the safety of the vaccines, and have provided important scientific information to develop newer generations of candidate vaccines with better ability to induce anti-HIV specific immune responses (60).

2.7.2 Why are vaccines tried in developing countries?

Historically vaccines become available and affordable for developing countries after the market in the high-income countries has matured. For example, the hepatitis B vaccine appeared in 1982 but only effectively became available in developing countries after 10-15 years when its price dropped from \$ 150 to about \$ 2-4 for the three dose vaccine series (60).

To achieve the goal of developing a successful HIV vaccine with global applicability, developing countries must be involved in the process from the beginning to the end. Since the vast majority of HIV infections are in developing countries, these countries should benefit the most from vaccination programs when a safe and effective vaccine is eventually available (61).

The African AIDS Vaccine Programme (AAVP) was founded in 2000, and issued The Nairobi Declaration: an African appeal for an AIDS vaccine. AAVP seeks " to advocate and support a coordinated effort to contribute to the global HIV vaccine development goals, ensuring that appropriate and affordable vaccines are developed for Africa in the short possible time". In anticipation of new vaccine candidates, preparations for HIV vaccine trials are being made in several African nations: In South Africa, Botswana, Malawi, Kenya, Uganda, Tanzania, Cameroon, Nigeria, and Cote de Ivoire preparations and early phase I/II trials are on the way (62).

In Ethiopia the national AIDS council, the umbrella organization that coordinates the country's National AIDS Control program, has recently added HIV vaccine research and development to its list of strategies against HIV/AIDS (63). As elsewhere the availability of an effective and affordable HIV vaccine is taken as the best hope for the future control of the epidemic in the country and as long as activities in the area of HIV vaccines are complementary and not in competition with other HIV prevention programmes. It was also emphasized that, in preparation of future vaccine research, it is important to strengthen national capacities, develop appropriate infrastructure and train national scientists in the areas of HIV vaccine related activities (62, 63).

HIV-1 preventive vaccine trials will demand motivated, informed participants, high retention and stable HIV incidence: large, well-characterized cohorts are essential (64,65). In advance of phase III HIV vaccine efficacy trials, it is of critical importance to develop appropriate cohorts and epidemiological characterize the target

population with regards to these factors. Of particular importance are accurate estimates of HIV incidence, which reflect the effect of other non-vaccine interventions (e.g. education, counseling, condom use, treatment of STD, etc.), which may be implemented to the trial population, so that the correct sample size for the trial can be determined (64 - 66).

It is also basic to conduct social and behavioral research to assess the motivation of populations to participate in trials; to determine ethical and logistically feasible incentives for the recruitment and long-term follow-up of trial volunteers; to develop effective communication approaches to obtain true informed consent by the trial volunteers; to develop effective means of education and counseling before, during, and after the trial; to develop innovative methods to accurately assess and monitor risk behavior in trial populations; and to ensure confidentiality and to preserve human rights. Of equal importance is the development of strategies of public information in relation to HIV vaccine trials in the community and in the country (64-66).

Studies have shown that the commonest reasons for willingness to participate in trials include different benefits or personal reason, including altruism and stopping the spread of HIV. Being disadvantaged, sexually risky and at perceived HIV-risk, fear of negative side effects and safety issues, contracting HIV from the vaccine itself and fear of social reaction (66, 67) fear of health problems, and having had a regular sex partner were found to be negative predictors of participation (14). In a study done among male factory workers and estate workers in Wonji Shoa Sugar Factory estate

to study the acceptability of a long-term research project on HIV/AIDS, workers responded that fear of blood drawing, embarrassment in answering questionnaires and lack of incentives to join a long term research on HIV /AIDS would defer them. However, acceptability of a long term research project was 98 and 99% in estate and factory workers respectively (55).

Among subjects who were willing to participate in a trial in Uganda, 20 percent of them said they would use condoms less frequently if they were enrolled in a trial. The findings stress the importance of making study participants understand the nature of a random, placebo-controlled trial (68). In a recent report from high school teachers in Addis Ababa, by Kidane F (2001), 98% of high school teachers were aware that vaccines are for protection and 50% were willing to participate in a vaccine trial; history of previous vaccination and response that vaccine is for protection were negatively associated with willingness to participate. Willingness to have blood tests for blood and response that vaccine is important were the two main reasons for willingness to participate (52).

2.8 Summary of literature review

The HIV-1 epidemic is on the increase globally with an exceptionally higher rate in sub-Saharan Africa. Estimating the incidence of HIV-1 infection has become a critical step in monitoring the epidemic and the combination of behavioral data gives it strong evidence. With the advancement of laboratory technologies it has now

become possible to estimate incidence from a cross-sectional survey and the inconveniences of cohort studies can be overcome. Incidence estimates may be used in selection of a group for longer follow-up of vaccine trial studies. Changes in age of sexual debut, casual and commercial sex trends, partner reduction, increase in condom use, voluntary country counseling and testing all appear to have played key roles in declines of incidence in different part of the world. An HIV vaccine has become a long-term hope in the prevention activities globally. In preparation for HIV vaccine trial, conducting social and behavioral research concerning the candidate population is mandatory.

3 Objective of the study

3.1 General objective

- To determine the prevalence and incidence to HIV-1 infection in the general population of Wonji Shoa Sugar Factory Estate.

3.2 Specific Objectives

1. To determine the prevalence and incidence of HIV-1 infection among the 18-29 years aged residents of the estate.
2. To identify socio-demographic and behavioral factors associated with the prevalence and incidence of HIV-1 in the estate.
3. To assess the knowledge and willingness to participate in a HIV vaccine trial.

4. Methodology

4.1 Study design - a cross sectional descriptive study

4.2 Study area- Wonji Shoa Sugar Factory Estate

Wonji Shoa Sugar factory estate is located 107 km south east of Addis Ababa in Adama Woreda East Shoa zone of Oromiya region. It is just 12 km south of the town of Nazareth (Adama). It is one of three sugar factories in the country and was established in 1953 EC. According to the 2000 census the total resident population was 19,789. Half of the population in the vicinity of the estate settles in the two factory villages Wonji and Shoa and the remaining half is scattered in the plantation villages. The majority of the adult population is composed of migrant laborers from the south and central highlands of Ethiopia. Kembata, Oromo, Amhara and Hadya are the major ethnic groups in the estate and 54% of the community is in the age 15-44 years. One hospital, two health centers and ten satellite clinics serve the employees and their families. The medical service is meant to run both preventive and curative care consisting of five physicians, 16 nurses and 56 health assistants where the public health unit composes the largest share of the staff and the activity. The factory comprises about 7000 workers in the harvest season including one third seasonal laborers and cane cutters from different parts of the country. The Ethio Netherlands AIDS Research Project (ENARP), Family Guidance Association of Ethiopia, Pathfinder International and Organization for Social Services against Aids (OSSA) all work in collaboration with the medical service in the campaign to combat the spread of HIV/AIDS. Information Education and Communication on HIV aids through health education session in the health institutions, residential quarters and schools, condom distribution and Of all, ENARP has been engaged in running the first open cohort to

study the natural history of HIV since 1997 with a 6 monthly follow-up and blood testing and counseling. Voluntary counseling and testing and intense IEC campaign through trained counselors, workplace peer promoters and youth art clubs is also underway with technical assistance from the Zonal Health office and Pathfinder international.

4.3 Source population all adults who are residents of the estate.

4.4 Study population and sample size determination

For this study the number of participants was determined assuming a future HIV vaccine trial intervention and the age group 18-29 was considered. For logistic reasons, plantation camps nearest to the factory villages the nine plantation camps closest to the factory villages where ENARP participants reside were selected from a total of sixteen plantation villages. The study was done at two steps first the sero survey followed by the behavioral survey.

4.4.1 Sample size for the sero survey

The required sample size was calculated based on the minimum incidence rate considered adequate for future vaccine trial. Using the formula to determine sample size for a single population proportion.

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

P = required incidence 0.015

d = the maximum precision to handle affordable sample size 0.00552

95% confidence interval where $\alpha=0.05$ which is equal to 1.96

Expecting the issue of testing for HIV testing is to be sensitive, a non- response rate of 15% was taken and the sample size was calculated to be 2300.

4.4.2 Sample size for the behavioral survey was also determined using the above formula.

Taking the assumption that

P= the prevalence of HIV-1 infection in the estate 8.5%

Level of significance $\alpha=0.05$

d= 0.03 margin of error and a non-response rate of 20%, the sample size was determined to be 398.

4.5 Selection of participants

A census taken in 2000 was initially intended as a sample frame, but considerable out migration (approximately 30%) had taken place since this census, thus complete enumeration of all men and women aged 18-29 was made. This new enumeration list was used as a sample frame, and study participants were selected from it using random numbers generated by EPI info 6. First participants for the serosurvey were selected, then those for the behavioral survey. In both cases only volunteers were considered if and only if they wish to participate with a full written consent.

4.6 Measuring instruments

4.6.1 Questionnaires used

Part I - For the HIV sero survey a questionnaire summarizing the basic socio-demographic characteristics of the study participants as per WHO guidelines for second generation HIV-surveillance, was used. No personal identifiers were included and

individuals were given a unique code number to be attached on the questionnaire and test tubes.

Part II - For the survey on the behavior linked to HIV /AIDS and knowledge and willingness to participate in HIV vaccine trial the standardized questionnaire on behavioral surveillance surveys for adults was used with addition of a part on knowledge and willingness to participate in HIV vaccine trial which was organized from pertinent literatures and a questionnaire used for similar purposes. The questionnaire was applied to those who are not involved in the serosurvey. The design was in reference to the principles of second generation HIV surveillance. Thus behavioral and biological information was taken from different individuals representing the same population.

4.6.2 Laboratory tests applied

Tests to determine the prevalence of HIV-1 infection

To determine the prevalence of HIV -1 infection among the study participants blood drawn each day was centrifuged on the same day, kept at -4°C over night and sent to the ENARP laboratory in Addis Ababa the next day for serological test. A single ELISA was done on all the samples and all the positives were rechecked with a second ELISA. The discrepant results were confirmed using rapid Determine test.

Test to determine recent HIV-1 infection

Those samples that were found to be positive on the ELISA were isolated and on the permission offered from the ethical committee of the Ethiopian Health and Nutrition Institute were sent to the virology laboratory at the Center for Diseases Control where the BED-Capture assay was done.

Incidence per 10 persons per year is calculated by using the formula that accounts for the total number of people at risk (Seronegative + Recent infection) and corrected for the year using the factor (365 / T), where T is the seroconversion duration.

$$I (\text{Incidence}) = \frac{n}{m + n} \times \frac{365}{t}$$

Where **n** is the number of persons who will be ELISA positive (EIA-S reactive) but

EIA-LS non- reactive

m is the number of persons who are ELISA negative(EIA-S non-reactive)

t is the time estimated mean number of days between Seroconversion on EIA-

S and EIA-LS

4.7 Data and Blood sample collection

4.7.1 For the behavioral survey three male and two female 12 grade complete data collectors were recruited from the nearby villages Gefersa and Alemtena and they were given training for seven days. The training included three days class discussion and orientation to the questionnaires and the purpose of the study, followed by two days field test of the questionnaire and data collection. The field test was in Gefersa village. The principal investigator and two supervisors supervised the whole work. Up on working in a specific village or camp the whole group moved in pairs early in the morning and found selected candidates in their respective homes. Those who were in the field, factory or office for work were given an appointment for a convenient time and were visited in the evening or morning as requested.

4.7.2 For the serosurvey three health assistants already working in the blood bank were selected and briefed on the process of data and blood sample collection using short questionnaire and Vacutainer tube. Blood was taken from study participants who were

selected randomly and volunteered to give a sample for the purpose of the study. Intense community mobilization and sensitization was made to achieve the maximum participation from the community through the community leaders, youth anti AIDS clubs and peer prompters using community meetings, school sessions and distribution of information leaflet.

4.8 Data quality issues

The questionnaires were first prepared in English and translated back to Amharic. Translating back to English ensured consistency of the questions. Pre testing of forty of each questionnaire type was done in Gefersa and Kuriftu villages, out of the estate. The clarity, understandability and flow of each question and the time to fill the questionnaire were assessed. Daily all the collected data were checked for completeness by the principal investigator and the supervisors. The selected candidates were visited twice by appointment and taken as refusal if they failed to appear on the third visit.

4.9 Data entry and Analysis

The statistical package Epi info version 6 was used to enter data by a data entry technician and the principal investigator and double entry was considered to ensure the data quality. The principal investigator using the Epi info version 6, SPSS version 10 and STATA software did analysis. Odds ratios and 95% confidence intervals were used to assess the presence and degree of association between independent and outcome variables. Logistic regression from the SPSS and STATA soft ware was used to identify see associations between the dependent and outcome variables and to identify and control for confounding variables.

4. 10 Operational Definitions of Terms

HIV-1 positive	a positive ELISA test result confirmed with a second one.
Old HIV-1 infection	a positive test result with the standard ELISA test and negative with the BED-capture assay for recent infections.
Recent HIV-1 infection	a test positive for both the standard ELISA test and the BED-capture assay for recent infections.
Regular partner	a sexual partner either a spouse or one has lived together for the last 12 months.
Non-regular partner	partner that the respondents are not married and have never lived with and did not pay.
Commercial sexual partner	a partner that who had sex with any opposite sex in exchanges of money.
Adequate knowledge	if a respondent correctly identify three preventive ways of HIV prevention.
Correct belief	if common misconceptions about ways of HIV transmission are correctly identified.

4.11 Ethical clearance

This study was done after getting ethical clearance from the ethical clearance committee of Addis Ababa University through the Department of Community Health. Written permission from the sugar estate administration was obtained following permission from the ethical clearance committee of the university. Every participant got a unique identifier code number and only code number was attached to the questionnaires and the test tubes. Each randomly selected individual was briefed about the aim of the study and selection process and written consent was taken before blood drawing and passing to interview. Individuals who wish to know their serostatus were referred to the voluntary testing and counseling unit activated after the initiation of this research. The transport and analysis of the HIV-1 positive samples to CDC laboratory in Atlanta was done after getting permission from the ethical clearance from the Ethiopian Health and Nutrition Research Institute.

4.1.1 Benefits of the study to the study participants and all concerned

The findings of this study will be used as a reference and baseline for ongoing HIV preventive activities in the estate and elsewhere in this country. The recently determined incidence and willingness to participate in HIV vaccine trial will be of importance for the ongoing activities of Ethiopian AIDS vaccine research initiative. The participants who wish to know their serostatus were offered a free of charge voluntary counseling and testing service at the estate Wonji hospital.

5. Results

5.1 Prevalence and incidence of HIV-1 infection

5.1.1 Socio demographic characteristics

In the serosurvey for the prevalence and incidence of HIV-1 infection (**Table-1**), a total of 1992 individuals aged 18-29 years (response rate of 86.6%) participated; of which 1248 (62.6%) were male and 744 (37.3%) female. The mean age (SD) was 21.4 (3.2) years. 1486 (74.8%) have attended high school and 681(34.1%) were still students and 750 (37.6%)were day laborers. 983 (49.4%) were from the plantation villages and the remaining 1012 (50.7%) were from the two factory villages Wonji and Shoa. The majority 1859 (93.2%) have lived for 7 or more years in the estate. By religion 1037 (52%) were orthodox Christian, 663 (33.4 %) were protestant Christians, 121 (6%)were Muslims and 144 (7%) were Catholics. 46% reported monthly income of 300 Birr or more.

Table 1. Socio Demographic characteristics of study participants aged 18-29 who enrolled in HIV –1 Sero-Survey among the residents in Wonji Shoa Sugar Estate, March 2003.

Variable	Number	%
Sex		
Male	1248	62.7
Female	744	37.3
Age		
18-19	732	36.7
21-24	867	43.5
25-29	393	19.5
Educational Status		
No formal education	41	2.1
Primary	324	16.3
Secondary	1486	74.5
Higher education	144	7.2
Religion		
Orthodox Christian	1038	52.1
Protestant	663	33.4
Muslim	121	7.2
Catholic	144	6.1
Others	26	1.3
Ethnicity		
Kambata	558	28.0
Hadiya	232	11.6
Wolita	179	9.0
Amhara	205	10.0
Oromo	665	33.4
Gurage	71	3.6
Tigrean	9	0.5
Others	75	3.8
Place of residence		
Plantation camps	983	49.3
Factory villages	1012	50.7
Total Duration in the estate		
1-3 Years	55	2.8
4-6 Years	81	4.1
7 Years and more	1859	93.2
Occupation		
Day laborer	750	37.6
Student	681	34.2
Permanent employee	72	3.61
Unemployed	488	24.5
Marital Status		
Married	596	29.9
Divorced	10	0.5
Single	1385	69.56
Want to have VCT		
Yes	1898	95.29
No	94	4.71

5.1.2 Serosurvey

Of the total 1998 samples collected one was clotted, two were without questionnaire and another three were taken from the analysis because the majority of the variables were incomplete. Hence a total of 1992 samples were analyzed in detail as is presented in **Table 2**.

Of the total 1992 samples tested for HIV-1 antibody 49 were found positive making the overall prevalence of HIV-1 infection 2.46 % in the community. The prevalence of HIV-1 infection was higher in males than females (3.49% and 1.84% respectively). The minimum and maximum age of the positives was 18 and 29 years and the mean (SD) age was 23.5(3.2) years, Being a female was found to have a statistically significant association with HIV-1 infection [OR=4.76(2.18, 10.40)]. The prevalence of HIV-1 infection was also found to be higher in the age groups 20-24 and 25-29 years with 3.57% [OR= 3.1(1.35, 7.36)] and 4.83% [OR=4.02(1.38, 11.72)], and higher among the residents of the two factory villages than the plantation ones with 2.37% in Wonji with [OR=2.87(1.23, 6.25)] and 2.39% in Shoa [OR=3.15(1.35,7.36)]. Permanent employees were found to have higher prevalence of 7.35% followed by day laborers and those unemployed with 6.56% and 4.99% respectively but being a day laborer by occupation was found to be significantly associated with HIV-1 infection [OR=6.12(1.84, 20.39)]. Marital status appeared to be associated during univariate analysis was no longer associated when controlled for other factors.

To identify recent infections among the HIV-1 positive samples, 48 of the 49 samples were fit for the BED IgG capture assay and among the 48 only 4 subjects were found to

be infected within the past 180 days. The incidence of HIV-1 infection in this study was found to be 0.41(0.03, 0.81) per 100 persons. (See calculation in the methodology section) the mean age of recent infections was 24.75 years, two from both sexes, three of them were from Wonji village and one was from plantation camp 5. Three were day laborers by occupation. The majority (95.29%) were willing to have VCT.

Table 2. Factors associated with Prevalence of HIV-1 and list of recent infection of HIV-1 infection among study participants aged 18-29 in Wonji Shoa Sugar Estate, March 2003.

Variable	ELISA RESULT		OR 95% CI	Adjusted OR# 95% CI	RECENT INFECTIONS BED-assay Positives (N)
	Positive No (%)	Negative No			
All subjects	49 (2.46)	1943			4
Sex					
Male	23 (1.84)	1225	1	1	2
Female	26 (3.49)	718	1.93[1.09, 3.40]	4.76[2.18, 10.40]*	2
Age					
18-19	6 (1.03)	726	1	1	
20-24	24(3.57)	843	3.44[1.40, 8.47]	3.1[1.35, 7.36]*	2
25-29	19 (4.83)	374	6.14[2.43, 15.52]	4.02[1.38, 11.72]*	2
Educational Status					
No formal education	4 (7.69)	48	2.96[0.71, 12.2]	2.2[0.42,11.50]	
Primary	11 (3.51)	302	1.29[0.40, 4.13]	1.11[0.29,4.24]	
Secondary	30 (2.03)	1451	0.73[0.25, 2.11]	0.67[0.20, 2.19]	3
Higher education	4 (2.74)	142	1	1	1
Place of residence					
Plantation camps	14 (1.42)	971	1	1	1
Shoa factory village	15 (3.34)	434	2.39[1.14, 5.00]	3.15[1.35, 7.36]*	
Wonji Factory village	20 (3.58)	538	2.57[1.29, 5.14]	2.78[1.23, 6.25]*	3
Occupation					
Student	4 (0.59)	677	1	1	1
Unemployed	14 (2.87)	474	4.99[1.63, 15.28]	1.51[0.41, 5.52]	
Day laborer	28 (3.73)	722	6.56[2.29,18.80]	6.12[1.84,20.39]*	3
Permanent Employee	3 (4.17)	69	7.35[1.61, 33.55]	3.36[0.61, 18.44]	
Marital status					
Single	25	1360	1	1	2
Married	23	583	2.14[1.20, 3.81]	1.09[0.55, 2.17]	2

#Adjusted for selected socio-demographic characteristics *(p<0.05)

5.2 Behavioral Survey

In the behavioral survey for knowledge on HIV/AIDS, vaccines and willingness to participate in vaccine trial, a total of 371 individuals aged 18-29 years (93.21%) were enrolled (**Table 3**). 210 (56.6%) were male and 161 (43.4%) were female. The mean age (SD) was 23.6 (3.9) years. 276 (75.8%) have attended high school and 90 (24.3%) were still students and 167 (45.0%) were day laborers. 170 (45.8%) were from the plantation villages and the remaining 201 (54.2%) were from the two factory villages Wonji and Shoa. The majority 345 (93%) have lived for 6 or more years in the estate. Only 6 (1.6%) and 71 (19.1%) reported drinking alcohol daily and weekly respectively. Only 35 (9.6%) reported that they were away from home for more than one month in the past one-year. By religion 181 (48%) were Orthodox, 155 (41.2%) were protestant, 21 (5.6%) were Muslim and 14 (3.7%) were Catholic.

**Table 3 Socio Demographic characteristics of study population aged 18-29
in Wonji Shoa sugar estate March 2003, (n=371)**

Variable	Number	Percent
Sex		
Male	210	56.6
Female	161	43.4
Age		
18-19	77	20.8
20-24	132	35.6
25-29	162	43.7
Educational Status		
No formal education	6	1.6
Primary	62	16.9
Secondary	276	75.8
Higher education	27	7.4
Religion		
Orthodox Christian	181	48.8
Protestant	155	41.8
Muslim	21	5.7
Catholic	14	3.7
Alcohol		
Daily	6	1.6
Once a week	71	19.1
Less than once a week	51	13.7
Never	243	65.6
Khat		
Yes	99	26.7
No	272	73.3
Ethnicity		
Kambata	106	28.6
Hadiya	94	25.3
Sidama	81	21.8
Amhara	41	11.1
Oromo	29	7.8
Other	20	5.4
Place of residence		
Plantation camps	170	45.8
Factory villages	201	54.2
Total Duration in the estate		
Less than one year	10	2.7
1-5 Years	16	4.3
6-10 Years	23	6.2
11 Years and more	322	86.8
Occupation		
Day laborer	167	45.0
Student	90	24.3
House wife	55	14.8
Gov't employee	26	7.0
Other	33	8.9
Monthly income (Birr)		
Less than 105	79	21.3
106-300	119	32.1
More than 300	173	46.6

5.2.1 Marriage Sexual History and Condom use

By marriage (**Table 4**) of the total 371, 124 (33.4%) were ever married; the mean age (SD) at first marriage was 19.7 (3.7) years extends from 10 year. 289 (77.9%) ever had sex in their lifetime and the mean age (SD) at first sex was 17.5 (2.5%) years (range 10-29 years). 225 (68.7%) had sexual intercourse in the past 12 months, and of these 255 sexually active participants 135 (52.9%) were males and 120 (47.1%) were female. Among these sexually active people 128 (34.5%) had sex with regular partners, 148 (51.2) with non-regular partners, and 37 (17.61%) with commercial sex workers. Only 4 individuals have sex both with regular and commercial partners.

Concerning condom use 174(46.95%) of the respondents had ever-used condoms in their lifetime, 14 (10.9%) reported using with regular partner in the past one-year, 109 (73.64%) with non-regular partners and 36 (97.3%) with commercial sex partners. The commonest reason for not using a condom in more than 85% of those who had sex with regular or non-regular partners was "I trust my partner" and "used another contraceptive" and 57 % of those who had sex with regular partners reported they left it for it was unnecessary. Only 8 (7%) of those who had sex with regular partners reported lack of knowledge of using condoms as a reason for not using condom. None of the sexually active groups reported either lack or expensiveness of a condom. There were 12 individuals with history of STD in the past, 9 were male and 3 were female. Of all the sexually active individuals 12 (3.25) had ever had a STD in their lifetime and all reported that they were treated in the clinics of the estate.

Table 4. Sexual History and condom use among study population aged 18-29 years Wonji Shoa Sugar Estate January 2003

Variable	Number	Percent
Ever married		
Yes	124	33.4
No	247	66.6
Age at first Marriage		
Less than 15 Years	6	4.8
15-19 years	44	43.5
19 years or More	74	51.6
Ever had sex		
Yes	289	77.9
No	82	22.1
Ever used condom		
Yes	174	46.9
No	197	53.1
Age at first sex		
Less than 15 years	14	3.8
15-19 years	219	59.0
19 year or more	56	15.2
Sexually active		
Yes	255	68.7
No	116	31.3
Have sex with Regular partner in the last year		
Yes	128	34.5
No	243	65.5
Number of regular partner		
None	166	57.4
1	115	39.8
2 or more	8	2.8
Condom use at last sex with regular partner		
Yes	14	10.9
No	114	89.1
Have sex with non-regular sex partner last year		
Yes	148	51.21
No	141	49.79
Number of non-regular partners in the last year		
None	134	46.2
1	124	42.9
2 or More	17	5.9
Condom use at the last sex with non-regular partner		
Yes	109	73.64
No	39	26.36
Consistent condom use with non-regular partner		
Every time	97	65.54
Almost every time	5	3.37
Some times	16	10.81
Never	30	20.27
Commercial sex the last year		
Yes	37	17.6
No	210	87.2
Number of commercial partners the last year		
1	24	64.86
2 or More	13	35.14
Condom use the last commercial sex		
Yes	36	97.3
No	1	2.7

5.2.2 Knowledge on HIV transmission beliefs prevention and willingness to have VCT.

All the 371 (100%) had heard of a disease AIDS, 367 (98.9%) and only 15 (4%) of the respondents had adequate knowledge of HIV prevention methods and misconceptions on HIV transmission respectively (**Table-5**). Participants level of perceiving themselves to be susceptible to acquire the virus was assessed by asking the item "what are your chances of getting infected with HIV?" . Only 12 (3.2%) assume themselves to be at high risk of acquiring HIV for they have engaged in high-risk activities in the past (**Table 9**). The commonest reason for assuming oneself to be at a high risk was, having sex with multiple sexual partners in 9 (75%), having sex with HIV positive partner in 6 (50%) having sex with a commercial sex worker, and having sex without a condom in 5 (47) each. Those with incorrect beliefs about HIV transmission 12 (3.2%) were assuming themselves as high risk [OR: 32.7(2.7,396.0)], the low level of risk perception was significantly associated with not having sex with commercial sex partners and being in the primary school level with OR=0.63(0.06, 0.67) and 0.06(0.006,0.76) respectively.

Of all the 371 interviewed only 30 (8.1%) were not willing to have VCT (**Table 8**). Those living in the plantation villages were found to be more willing to have VCT 123 (33.2%) [OR: 2.45(1.01,5.89)], and those who drank alcohol were more willing to have VCT. Neither having adequate knowledge nor having misconception or high-risk perception was found to be associated with willingness to have VCT.

Table 5. Knowledge on HIV Transmission, Beliefs on HIV prevention, History of STD, and Level of Risk perception and Willingness to have voluntary counseling and testing for HIV infection among study subjects Aged 18-29 in Wonji Shoa Sugar Estate. January 2003.

Variable	Number	Percent
Knowledge of HIV preventive method		
Yes	367	98.9
No	4	1.1
Beliefs about AIDS transmission		
Correct	356	96.0
Incorrect	15	4.0
Ever had STD		
Yes	12	3.2
No	359	96.8
Perceived Level of Risk		
Low	359	96.8
High	12	3.2
Reason for being at low risk (n=359)		
Not shared needle	264	73.5
Never have sex with HIV positive partner	262	73.0
I trust my partner	194	54.0
Reason for being High risk (n=12)		
Have sex with Multiple sexual partners	9	75.0
Have sex with HIV positive partner	6	50.0
Have sex with out condom	5	41.7
Have sex with commercial sex worker	5	41.7
Willing to have VCT		
Yes	341	91.9
No	30	8.1

5.2.3 Knowledge on Vaccines and Willingness to participate in HIV vaccine trial

Among the 371 individuals interviewed 337 (90.8%) reported that they had ever been vaccinated, 364 (98.1%) believed that vaccines are for prevention of disease and another majority 289 (77.9%) and 227 (61.2%) reported vaccines could be for cure and every person vaccinated is cured of the disease he/she is vaccinated for (**Table 6**). Three hundred 80.9% had ever heard of a study to prevent AIDS. Radio and television were major sources of information and 365 (98.4%) reported that the government of Ethiopia should allow AIDS vaccine trial. Ninety-seven and 92% reported that they would trust the safety of a vaccine if doctors or ministry of health explained to them respectively. 302 (81.4%) of the respondents assumed that an HIV carrier could participate in an AIDS vaccine trial and 24% reported that people who will engage in an AIDS vaccine trial would have unprotected sex more often.

The major point of worry if one was to participate in an AIDS vaccine trial was concern about sterile needles in 206 (55.5%) and 137 (37%) reported that they would worry about the side effects of the trial vaccine including the worry about getting AIDS from the vaccine and what will happen weeks after injection (37%) (**Table 7**).

Participants were explained the need to have repeat HIV test and administration of trial vaccine, and 125 (34.5%), 140 (37.7%), 60 (16.4%) replied that they would definitely, likely and somewhat likely participate in an AIDS vaccine trial respectively and 32 (8.6%) and 11 (3.0%) said, " Likely I will not" and "definitely will not " participate in an

HIV vaccine trial respectively. Among those who were willing to participate 266 (81%) reported they would allow follow-up till the vaccine was found.

As is seen in **Table 10** , being male [OR: 3.82 (1.87,7.83)] and in the income group 106-300 Birr [OR: 2.20(1.06,4.58)] were significantly associated with willingness to participate in an HIV vaccine trial, while being resident in the factory village and being a daily laborer were significantly associated with not being willing to participate in a vaccine trial [OR: 0.34(0.18,0.63) and OR: 0.21(0.06,0.59), respectively].

Table 6 History of vaccination, General Knowledge on vaccines and HIV vaccine trial among study population aged 18-29, Wonji Shoa Sugar Estate January 2003

Variable	Number	Percent
Ever vaccinated		
Yes	337	90.8
No	34	9.2
Vaccine is for prevention of a disease		
Yes	364	98.1
No	7	1.9
Vaccine is for a cure of a disease		
Yes	289	77.9
No	82	22.1
Vaccines can be made from the disease causing organism		
Yes	287	77.4
No	84	22.6
Every vaccinated 100% cured		
Yes	227	61.2
No	144	38.8
I will trust safety of a trial vaccine if (multiple answers possible)	362	97.6
Doctors tell me	341	91.9
Ministry of Health tells me	288	77.6
Any health professional tells me	209	56.3
Read on News papers	209	56.3
My employer tell me	188	50.7
Friends /Relatives tell me	10	2.7
Others		
Source of information about HIV/AIDS vaccine		
Radio	121	32.6
TV	95	25.6
News Paper	66	17.8
Doctors	44	11.9
Health professionals	42	11.3
Friends	41	11.1
Health education	36	9.7
Other	5	1.4
HIV carrier can participate in an AIDS vaccine trial		
Yes	302	81.4
No	69	18.6
If there were an HIV vaccine people would have Unprotected sex more often		
Yes	89	24.0
No	282	76.0
HIV AIDS vaccine trial participants need to continue to use condom or abstain		
Yes	254	68.5
No	117	31.5

Table 7. Potential sources of worry, expected benefits and willingness to participate in AIDS vaccine trial among study population aged 18-29 Wonji Shoa Sugar Estate, January 2003.

Variable	Number	Percent
If I am asked to join a trial I will worry for	42	11.3
Pain from the injections	206	55.5
Concern about unsterile needles	66	17.8
Side effects like fever, itching	72	19.4
What will happen weeks after injection	43	11.6
Might get AIDS from the vaccine	25	6.7
My spouse might not want me to join	40	10.8
Others may think that I am HIV positive	32	8.6
My family may not want me to join	77	20.8
Time and travel cost to the trial site	25	6.7
I may get placebo not the right vaccine	66	17.8
I have no point of worry		
Things that I feel important if I joined a trial	125	33.7
Money	192	51.8
Health insurance like 5 years	294	79.2
Thinking that the vaccine would provide protection	102	27.5
Admiration from friends and family	226	60.9
Knowing that I am helping the society	85	22.9
The complete physical exam at the beginning of the trial	10	2.7
Other		
Willing to join an AIDS vaccine trial	128	34.5
Definitely I will	140	37.7
Likely I will	61	16.4
Some what likely I will	32	8.6
Likely I will not	11	3.0
Definitely I will not		
If I joined a trial I will allow the follow up to extend	266	81.1
Till the vaccine is found	41	12.5
1-5 Years	21	6.4
More than 5 Years		

Table 8. Determinants of willingness to have voluntary counseling and testing Among 18-29 years aged Residents of Wonji Shoa Sugar Estate January 2003

Variable	Willing to have VCT		OR (CI)	Adjusted OR#
	Yes	No		
Sex				
Male	191	19	0.74[0.32,1.69]	0.56[0.251,1.292]
Female	150	11	1	1
Age				
18-19	68	9	1.00	1
20-24	124	8	2.05[0.69,6.17]	1.836[0.654,5.154]
25-30	149	13	1.52[0.57,4.02]	1.371[0.535,3.512]
Educational Status				
Primary	63	5	1	1
Secondary	253	23	0.87[0.25,2.47]	1.304[0.565,3.008]
Higher	25	2	0.99[0.15,11.06]	1.341[0.265,6.791]
Location				
Plantation	161	9	2.09[0.88, 5.08]	2.45[1.01, 5.89]*
Factory villages	180	21	1.00	1
Risk				
Low	329	30	1	1
High	12	0	1.09[0.15,48.32]	219[0.00, 2150]
Alcohol				
Yes	123	5	2.82[1.02, 9.66]	3.35[1.21,9.31]*
No	218	25	1	1
Knowledge of HIV Preventive method				
Yes	337	30	1	1
No	29	0	2.58[0.4, 108.91]	191[0.00, 3245]
Beliefs about AIDS transmission				
Correct	327	14	0.81[0.02, 5.67]	1.79[0.19, 16.36]
Incorrect	29	1	1	1

*Adjusted for selected socio-demographic characteristics *(p<0.05)

Nb. Too small numbers in many of the cells, reason for very wide range

Table 9 Determinants of Levels of risk perception towards AIDS among 18-29 years aged residents of Wonji Shoa Sugar Estate January 2003

Variable	Risk Perception		OR (CI)	Adjusted OR (CI)#
	Low	High		
Sex				
Male	204	6	1.32[0.34,5.02]	1.84[0.09, 36.04]
Female	155	6	1	1
Age				
18-19	77	0	2.45[0.27, 117.47]	0.02[0.00,4161]
20-24	125	7	0.57[0.14, 2.14]	2.29[0.40, 13.00]
25-29	157	5	1.00	1
Educational Status				
Primary	61	1	4.88(0.24, 292.49)	0.06[0.006, 0.76]*
Secondary	267	9	2.37(0.24,12.36)	0.31[0.04, 2.34]
Higher	25	2	1	1
Knowledge				
Yes	356	11	10.79(0.19,144.62)	316.8[0.00, 5388]
No	3	1	1	1
Beliefs on HIV transm				
Correct	347	9	1	1
Incorrect	12	3	0.10[0.02,0.68]	32.7[2.7,396.0]*
Location				
Plantation	165	5	1.19(0.32,4.85)	0.75[0.11,5.07]
Factory villages	194	7	1	1
Alcohol				
Yes	120	8	0.25(0.05,0.96)	3.17[0.59, 16.92]
No	239	4	1	1
Occupation				
Day laborer	163	4	1.00	1
Student	89	1	2.18(0.21,108.75)	0.95[0.33,27.55]
House wife	51	4	0.31(0.06,1.75)	17.8[0.73, 432.8]
Gov't employee	24	2	0.29[0.04,3.45]	2.48[0.10, 56.64]
Sex with sex workers				
Last 12 months				
Yes	33	4	1	1
No	326	8	4.94(1.03,19.52)	0.63[0.06, 0.67]
Ever STD				
Yes	11	1	0.35[0.04, 16.31]	16.74[0.97, 288.4]
No	348	11	1	1

Adjusted for selected sociodemographic and sexual characteristics

*(p<0.05)

Nb. Too small numbers in many of the cells, reason for very wide range

Table 10 Determinants of Willingness to Participate in an HIV vaccine trial among 18-29 years old residents of Wonji Shoa Sugar Estate January 2003.

Variable	Willing to Participate in an HIV vaccine trial		OR (CI)	Adjusted OR (CI)#
	Yes	No		
Sex				
Male	91	119	2.56(1.58,4.16)	3.82[1.87, 7.83]*
Female	37	124	1	1
Age				
18-19	34	43	2.26[1.23, 4.16]	1.62[0.72, 3.64]
20-24	52	80	1.86(1.10, 3.14)	1.54[0.83, 2.85]
25-29	42	120	1	1
Educational Status				
Primary	62	105	1	1
Secondary	55	116	0.80[0.5, 1.29]	1.05[0.60, 1.84]
Higher	11	16	1.16[0.47, 2.86]	0.78[0.28, 2.18]
Location				
Plantation	78	90	1	1
Factory villages	49	140	0.4[0.25,0.65]	0.34[0.18, 0.63]*
Occupation				
Day laborer	59	108	0.55(0.22,1.35)	0.21[0.06,0.59]*
Student	37	53	0.70(0.27, 1.83)	0.46[0.15,1.43]
House wife	14	41	0.34(0.11, 1.01)	0.28[0.07, 1.04]
Gov't employee	13	13	1	1
Risk				
Low	124	235	1.06(0.28,4.88)	0.86[0.21,3.48]
High	4	8	1	1
Alcohol				
Yes	46	82	1.1(0.69,1.77)	1.13[0.65,1.97]
No	82	161	1	1
Income				
<106	20	59	1	1
106-300	55	64	2.54(1.30, 4.96)	2.20[1.06, 4.58]*
>300	53	120	1.30(0.69, 2.49)	1.40[0.63, 3.07]
Knowledge				
Yes	125	242	1	1
No	3	1	5.8(0.46, 306.1)	955[0.0, 7628]
Beliefs on HIV Transmission				
Correct	123	233	1	1
Incorrect	5	10	0.95(0.25,3.12)	1.70[0.45, 6.44]

Adjusted for selected socio-demographic characteristics

*(p<0.05)

6.Discussion

There are few community-based studies on HIV infection or estimates of incidence in this country. This is the only community-based study combining both the biological and behavioral information with estimation of incidence of HIV-1 infection. The use of a standard questionnaire, pretest and training of data collectors makes it internally valid. The community based design; the representative large sample size taken from the age group 18-29, and the random selection of study participants makes the findings more generalizable for the whole population of Wonji Shoa Sugar Estate and similar sites.

Identification of the behavioral factors that feed the epidemic definitely strengthen the planning of future preventive activities and more over, addition of the incidence estimate will give the best estimate of the trends of the epidemic. As the country is moving to be part of HIV vaccine research in the coming years, identification of the major behavioral and incentive issues for a future educational program or cohort preparation and characterization is analyzed in this study.

Behavioral change interventions address two factors: what places people and communities at risk and why they are at risk. Reducing the risk of HIV infection slows the epidemic. By diminishing vulnerability it is possible to decrease the risk of infection and the impact of the epidemic. By decreasing the impact of the epidemic likewise it is said it is possible to reduce the vulnerability of HIV and AIDS. The results of this study have shown that gender, age, place of residence and occupation were significantly

associated increased vulnerability to HIV - 1 infection. No significant association was found between serostatus and education or malarial status.

To change their behavior people need to have some basic knowledge of HIV and be aware of their risk of HIV infection. They must be taught a set of protective skills and offered access to appropriate services and products like condoms, VCT services, and STI treatment.

In this study 99% of the respondents do know basic preventive methods of HIV prevention. As it is described in the Results section, though 75% of the respondents have ever had sex, only 47% have ever used a condom. Among the 148 (51.21%) who reported non-marital sex in the past year, 39 (26%) of them did not use condoms. This shows there is a gap in condom use despite the high knowledge of its importance. Despite being involved in risky sexual behavior, almost 96.8% perceive themselves as being at low risk to acquiring HIV. Condoms are key to existing preventive activity by reducing risk of both STIs and HIV. These findings enforce us to recommend the issue of use of condoms as an area of intervention that needs to be strengthened in this community. Misconception about beliefs in the means of transmission of HIV was noted in 15 (4%). 15 individuals responded that mosquito bites could be one of the routes of transmission. Since the area is an irrigated state farm existence of mosquitoes is not denied. To avoid unnecessary worries and isolation of HIV carriers there need to be a targeted dissemination of information to correct this incorrect belief.

Voluntary counseling and testing is one of the proven preventive strategies which enable individuals to make an informed choice to be tested, to learn about how HIV is transmitted, practice safer sex, get a HIV result and depending on the result take steps to avoid becoming infected or infecting others (13). In this study a large number 341 (92%) reported that they would be willing to have HIV an test be told their results if they were given the chance. Studies in other parts of the country have also shown similar figures (41.5% among adults in Dubti ()),

Being resident in the plantation villages was significantly associated with willingness to have VCT than being in the factory villages. The possible explanation that could be given will be either possible absence of denial, or absence of fear of stigma or discrimination. The actual willingness should be tested by facilitating the VCT service as per the need of this community.

Strengthening the VCT service might include - publicizing the benefits of the VCT service, integration of the VCT service with the existing health service, providing full time accessibility, making the service. Community involvement in running VCT services should be considered and if possible, same day VCT be adapted like the success in Uganda.

The conduct of social and behavioral studies as an initial step in a HIV vaccine trial will help in designing the educational materials and trial procedures. In the present analysis Being male and being in the income group 106-300 Birr were significantly associated

with being more willing (have positive attitude) to participate in HIV vaccine trials, where as day laborers, and residents of the factory villages were found to have significantly less willing (have negative attitude) to participate in HIV vaccine trial.

The prevalence of HIV-1 infection in this study was 2.46%, which was a bit lower than findings of community based studies in Addis Ababa in 1994 (47), in Wonji 1996(55), from army and military recruits in 2000(17,18); and among out of school students in Addis Ababa (16). The figure for Wonji has shown a decrease, which could be part of the national decrease in HIV-1 infection among antenatal care attendees (10) and could be as result of the impact of the preventive activities nationally and specifically in the community which was reflected in decline in risky sexual behavior and decreased report of casual sex and sex with commercial sex workers among the cohort participants (11).

The incidence of HIV-1 infection in this study was higher than the cohort finding at similar site. This is because the current study focused on a relatively younger part of the community where there is more chance of exposure to risky sexual practices. Moreover since the cohort is under continuous intervention of testing and counseling of its participants the chance of getting recent infections might be on the decline ending up in accumulation of low-risk individuals.

Most HIV transmission in sub-Saharan Africa occurs through heterosexual intercourse, and this behavior varies greatly across cultures, age groups, socioeconomic class and gender (13). The rapid spread of HIV in poor countries has been attributed mostly to

risky sexual behaviors including social vulnerability of women and young people. Our result in the current study has shown that there is significantly excess risk of HIV infection among females than males. This is in line with the recent national estimate and similar findings (10,18,19) and findings of similar studies in Uganda, Kenya, Zambia and South Africa which have shown 2-6 times more risk in girls than boys of the same age (13, 60, 70, 71). These studies have shown that young women are consistently found to have higher prevalence rate of HIV infection than men of the same age group. There is also evidence that young women are physiologically more susceptible to STDs and socially vulnerable. This is an alarming sign to focus on women in the prevention campaigns as millions of girls in or nearing their early teens are at risk. It is an indication that girls in this community should know the facts that they are at high risk of being infected quickly even if they have just one partner. Based on this, parents, schools and communities and all working in the prevention area must make sure that girls have the information skills and tools to delay first sex and resist unwanted or unsafe intercourse. In addition to focusing the prevention in this direction social pressure must be put on men involved in this sexual behavior so that the hypothesized cross-generational sex driving the epidemic will be averted.

Another finding in this study is the significantly higher prevalence in the age groups 20-24 and 25-29 years. This was also consistent with the existing national estimate among antenatal attendees, military and police recruits (10,17, 18) and findings in another African countries (13, 69-72). As sexual intercourse is the major means of transmission in this country the current finding could clearly be as a result of the start of the sexual act

at a younger age and the high level of risky sexual behavior among those above 20. The mean age at first sex in this community was found to be 17 years and more than 68% of the respondents were sexually active 60% of the sexually active respondents had started sex before they were 19 years old. With this in mind and based on the fact that three quarters of the recent HIV infections are among the age groups 20-24 and 25-29 we can definitely consider that delaying initiation of sexual debut in the younger age and targeting the reduction of risky sexual behavior in the whole group would be a priority in this community.

This study has shown that the prevalence of HIV infection was significantly higher in the two factory villages Wonji and Shoa. This was also similar with the findings of Sahilu et al at the same site WSSF in 1996 (overall HIV-1 prevalence in the estate, 5% in Wonji village, and 2.3% in plantation camps) (55), Zewde et al among police recruits in Addis Ababa (18). Fontanet A et al in Addis Ababa 1994(46) and Bloom S et al in Tanzania (72) have got similar findings. Sub-villages with highest level of social and economic activity and those living at a relatively shorter distance from the nearest town are found to have two to five times higher risk of being infected with HIV (72). It is logical that as the nearby town is more accessible this will enhance the chance of individuals engaging with commercial sex workers and thus having more partners. This will also be enhanced when large numbers of single migrant men live together making the male to female ratio higher (10,72). The two factory villages Wonji and Shoa have more or less urban life style. They are with intimate contact with the town of Nazareth as it is much closer and transportation is more accessible from these villages than the plantations. This suggests

the need to investigate the prevailing behavior and level of the epidemic in the surrounding small towns Wonji Gefersa, Kuriftu and Shoa-Alemtena.

The findings of this study have revealed that the community is well aware of vaccines. The majority believes that vaccine is for cure and HIV positives can participate in HIV vaccine trial. Moreover the belief not to avoid risky sexual behavior if one is enrolled in HIV vaccine trial is reflected. Similar findings were found on the initial studies of HIV vaccine trial in Uganda and Thailand (64, 67, 68). This survey indicates the need to alleviate these misconceptions. It was also shown that the major points of worry in participation HIV vaccine trials were the fear of procedures and side effects reflecting the need for clear explanation of the trial steps and assurance of safety of a candidate vaccine. The high level of willingness to participate in vaccine trial together with the relatively stable type of life style and low incidence of HIV-1 infection makes Wonji Shoa Sugar estate a suitable area for phase I/II vaccine trials.

7. Strength and limitation of the study

7.1 Strength of the study

This is one of the very few community-based studies with random selection of participants focusing on the younger age group of the society to address the objectives of the study. In addition both biological and behavioral data from a community with

representative number of participants at the same time and the large sample size represented has helped to determine significant differences. To ensure the validity and reliability of the information generated by this study pretesting of the questionnaires, comparison of the findings with results from similar studies and use of the same sex interviewers-respondent arrangement was used.

7.2 Limitations of the study

This survey comprises a large population of approximately 2000 persons aged 18-29 years, with 49 persons infected with HIV. Of these 49 persons, only 4 were recently infected with HIV- 1, determined in a recently developed assay. This small number makes it difficult to analyze the determinants of the incidence specifically. Our survey included more males than females, however, we would have expected a more balanced sex ratio, especially in view of the high response rate. This unexpected difference requires further investigation. The inclusion of different proportions in the same age groups is another limitation in detail comparison. Inquiring about risky sexual behaviors during systematic interview has the potential risk that more likeable answers are provided. Therefore, determining the magnitude of risky sexual behavior may be biased. Further qualitative research will be helpful to understand perceptions of the population on HIV and related matters.

8. Conclusions

- The prevalence of HIV-1 infection in the community of Wonji Shoa Sugar estate is 2.46%, which is lower than prevalence in most of the reports from other part of the country.
- The incidence of HIV-1 infection was 0.4 % per 100 persons, which is higher than the finding of the existing cohort in the area.
- Prevalence of HIV-1 infection was significantly higher among females, in the age groups 20-24 & 25-29, among residents of the two factory villages Wonji and Shoa, and among day laborers.
- Despite higher knowledge of HIV prevention still there are misconceptions that mosquitoes can transmit HIV.
- Though most of the respondents reported being involved in risky sexual behavior especially sex with non-regular partners with fairly low use of condoms, the majority of them considered themselves as low risk for HIV.
- There is reduction in the reported risky sexual behavior compared to the previous findings.
- There are major misconceptions regarding use of vaccines while still the great majority accepts the importance of HIV vaccine trial.
- Large numbers of the participants were willing to participate in HIV vaccine trial and would accept follow-ups till the vaccine is found.

9. Recommendations

- Estimation of incidence from cross sectional surveys is possible and poor nations like Ethiopia will benefit by adopting the techniques for determination of incidence in a fairly cheap, timely and reliable way.
- Revision of the information spread regarding HIV/AIDS so that much of the misconception will get solved and further evaluation of the gap between knowledge about condoms and their use by those involved in non-regular sexual activity.
- Strengthening the existing preventive activities either to maintain or further reduce the level of HIV infection through active involvement of females, work place peer promoters and increasing access to preventive activities.
- Making the VCT service more sustainable and more near to the community with permanent staff all the working days and if possible adopting the "same day result" principle.
- Intense Vaccine education before the start of vaccine trials if any.
- Determining the state of epidemic in the nearby villages of the estate and adopting appropriate preventive strategies like dissemination of information and creating access to condoms.
- Wonji Shoa Sugar factory Estate is a low prevalence and low incidence of HIV –1 infection with a stable population and majority willing to participate in HIV vaccine trial. This makes it an appropriate site for Phase I/II HIV vaccine trials.

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Annex I

QUESTIONNAIRE TO BE USED IN COMMUNITY BASED STUDY OF HIV – 1 PREVALENCE AND INCIDENCE AND KNOWLEDGE AND WILLINGNESS TO PARTICIPATE IN HIV VACCINJE TRIAL-WONJI SHOA SUGAR ESTATE

001	Questionnaire Identification Number		
002	Respondent ID number		
003	Current date		

Hello, “I’m _____ and I am working here in Wonji Shoa Sugar factory estate for a research undertaken by Addis Ababa University. I would like to ask you some questions about your personal background and your health. I will not write your name anywhere on this paper. All information you are giving is confidential. It will never be connected to your name. Therefore; your honest and genuine participation by responding to the questions prepared is highly appreciated and credited in the national campaigns to the control of HIV/AIDS. If you don’t understand a question please don’t hesitate to ask to ask me for clarification.

Would you be willing to participate?” 1. Yes 2. No

Signature _____

004	Camp / Factory village name		
005	House number		
006	Interviewer name		
007	Editor		
008	Data entry name		
009	Data entry supervisor		
<i>Interviewer visit</i>	Visit 1	Visit 2	Visit 3
Date			
Result			

Result codes: Completed 1; Respondent not available 2; Refused 3; partially completed 4; Other 5. **DO NOT WRITE THE RESPNDENT’S NAME ANYWHERE ON QUESTIONNAIRE**

SECTION .1 DEMOGRAPHIC BACKGROUND CHARACTERISTICS

No.	Questions and filters	Coding categories																											
101	Sex of the respondent	Male 1 Female 2																											
102	What is your age?	Age in completed years Don't know 88 No response 99																											
103	What is your religion? CIRCLE ONE	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>Orthodox</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Catholic</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Protestant</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Muslim</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>No religion</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Others (specify) _____</td> <td></td> <td></td> </tr> <tr> <td>No response</td> <td></td> <td style="text-align: center;">99</td> </tr> </tbody> </table>		Yes	No	Orthodox	1	2	Catholic	1	2	Protestant	1	2	Muslim	1	2	No religion	1	2	Others (specify) _____			No response		99			
	Yes	No																											
Orthodox	1	2																											
Catholic	1	2																											
Protestant	1	2																											
Muslim	1	2																											
No religion	1	2																											
Others (specify) _____																													
No response		99																											
104	To which ethnic group do you belong?	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>Kembata</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Oromo</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Amhara</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Hadiya</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Wolita</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Gurage</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Tigrean</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Other _____</td> <td></td> <td style="text-align: center;">8</td> </tr> </tbody> </table>		Yes	No	Kembata	1	2	Oromo	1	2	Amhara	1	2	Hadiya	1	2	Wolita	1	2	Gurage	1	2	Tigrean	1	2	Other _____		8
	Yes	No																											
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Oromo	1	2																											
Amhara	1	2																											
Hadiya	1	2																											
Wolita	1	2																											
Gurage	1	2																											
Tigrean	1	2																											
Other _____		8																											
105	Have you ever attended school?	Yes 1 No 2 No response 99																											
106	What is the highest level of school you completed?	Primary grade 1- 6 1 Junior Secondary 7- 9 2 Secondary 10-12 3 Higher 12+ 4 No response 99																											
107	Where is your home location?	Camps 1 Factory villages 2 No response 99																											
108	How long have you lived here in Wonji?	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Completed years lived</th> </tr> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>Less than 1 year</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>1-5 years</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>6-10 years</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>11 years and more</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>No response</td> <td></td> <td style="text-align: center;">99</td> </tr> </tbody> </table>	Completed years lived				Yes	No	Less than 1 year	1	2	1-5 years	1	2	6-10 years	1	2	11 years and more	1	2	No response		99						
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Less than 1 year	1	2																											
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6-10 years	1	2																											
11 years and more	1	2																											
No response		99																											

109	Do you work for WSSF?	Yes 1 No 2
110	What is your main occupation?	Not employed 1 Farmer/Gardner 2 Unskilled laborer 3 Local driver 4 Long distance driver 5 House maid 6 House wife 7 Civil servant 8 Soldir 9 Police 10 Merchant 11 Bar/Pub/Restaurant Work 12 Commercial sex worker 13 Street seller 14 Teacher 15 Student 16 Other (specify)_____ 17
111	What type of work do you usually do?	Occasional work (3 months) 1 Seasonal work (8 months) 2 Permanent work 3 Contract work 4 Refused 88 Don't know 99
112	How much is your total family monthly income?	Birr < 105 1 106-300 2 301-400 3 > 400 4 Don't know 88 No response 99
113	In the last 12 months have you been away from your home for more than one month altogether?	Yes 1 No 2 Don't know 88 No response 99
114	How many nights did you spend outside of your camp/or village in the last month?	Number _____ Don't know 88 Refused 99
115	What was the common reason for you to travel out of Wonji?	Business 1 Recreation 2 On work for WSSF 3 Job seeking 4 Shopping 5 Visiting family 6 Mourning 7 Dont know 88 Refused 99

116	During the last 4 weeks have you drunk alcohol? If yes , how often have you had drinks containing alcohol? (Alcohol includes like Tella, Tej, Arake, Beer) Would you say READ OUT CIRCLE ONE	Every day 1 At least once a week 2 Less than once a week 3 Never 4 Don't know 88 No response 99
117	Some people have tried a range of different types of drugs. Which of the following, if any, have you tried? READ LIST	Yes No Dk Nr Khat 1 2 88 99 Shisha 1 2 88 99 Hashish 1 2 88 99 Benzene 1 2 88 99 Mandrax 1 2 88 99 Cocaine 1 2 88 99 Crack 1 2 88 99
118	Some people have tried injecting drugs using a syringe. Have you injected drugs in the last 12 months? DRUGS INJECTED FOR MEDICAL PURPOSES OR TREATMENT OF AN ILLNESS DO NOT COUNT	Yes 1 No 2 Don't know 88 No response 99
119	Are you member participant of ENARP	Yes 1 No 2 Don't know 88 No response 99

Section 2: Marriage and live-in partnerships

No.	Questions and filters	Coding categories
201	Have you <i>ever</i> been married?	Yes 1 No 2 Don't know 88 No response 99
202	How old were you when you first married?	Age in years [__ __] Don't know 88 No response 99

No.	Questions and filters	Coding categories
203	Are you <i>currently</i> married or living with a man/woman with whom you have a sexual relationship?	Currently married, living with spouse 1 Currently married, living with other sexual partner 2 Currently married, not living with spouse or any other sexual partner 3 Not married, living with sexual partner 4 Not married, not living with sexual partner 5 No response 99
204	IF MARRIED: <u>Men</u> : Do you have more than one wife? <u>Women</u> : Did your husband have other wives?	Yes 1 No 2 No response 99
205	If you are not married currently what is your status?	Never married/Single/ 1 Widowed 2 Divorced 3 Separated 4 No response 5

Section 3: Life time risks-Sexual Behavior

No.	Questions and filters	Coding categories
301	Some speak, as there are different types of sexual intercourse. What type of sexual intercourse do you know? CIRCLE 1 IF MENTIONED, 2 IF NOT MENTIONED	Y N 1. Vaginal 1 2 2. Anal 1 2 3. Oral 1 2 Don't know 88 No response 99
302	Have you <u>ever</u> had sexual intercourse? [For the purpose of this survey," sexual intercourse," is defined as vaginal or anal sex].	Yes 1 No 2 Don't know 88 No response 99
303	At what age did you first have sexual intercourse? PROBE	Age in years _____ Don't know 88 No response 99

304	Who was the first person you had sexual intercourse with?	Family member 1 Friend 2 Spouse/Cohabiting Partner 3 Casual Partner, the same age 4 Casual Partner,10+yrs older 5 Some one to whom you gave or received money or goods for sex 6 Someone of the same gender 7 Refused 8 Don't know 9
305	What made you have your first sexual intercourse?	I had personal desire 1 Was persuaded with friends 2 Was under the effect of Alcohol/Drugs 3 Wanted to try it 4 Was forced/Raped 5 Expected a gift/Reward or money from a partner 6 Marriage 7
306	Have you had sexual intercourse in the last 12 months?	Yes 1 No 2 Don't know 88 No response 99
307	For WOMEN: Think about the male sexual partners you've had in the last 12 months. <i>For MEN:</i> Think about the female sexual partners you've had in the last 12 months. How many were: - Your spouse(s) or live-in sexual partners (" regular " partners) - " Commercial "(Partners whom you paid to have sex with) - Sexual partners that you are not married to and have never lived with and did not pay (" non-regular " partners) –DO NOT INCLUDE CURRENT SPOUSE (S) OR LIVE-IN SEXUAL PARTNERS) - Sexual partner with whom you have had a relation for more than 12 months, but is not your spouse or live-in partner	If the respondent have no regular, commercial, non-regular sexual partners write '00' REGULAR [__][__] Don't know 88 No response 99 COMMERCIAL [__][__] Don't know 88 No response 99 NON-REGULAR [__][__] Don't know 88 No response 99 OTHER PARTNER [__][__] Don't know 88 No response 99

308	In your lifetime, have you ever paid money or goods for sex?	Yes 1 No 2 Don't know 88 No response 99
309	In your lifetime, have you ever received money or goods for sex?	Yes 1 No 2 Don't know 88 No response 99
310	In your lifetime, have you ever had sex with a casual partner who was 10 or more years older than you?	Yes 1 No 2 Don't know 88 No response 99
311	In your lifetime, have you ever had sex with a partner of the same gender?	Yes 1 No 2 Don't know 88 No response 99
312	Have ever had sex with some body forced or against your will ?	Yes 1 No 2 If the answer is no skip to 401 Don't know 88 No response 99
313	How old were you when you were first forced to have sex against your will?	Years _____ Don't know 8 No response 9
314	Who forced you to have sex with them?	Family member 1 Long-term partner 2 Friend 3 Stranger 4 Senior work colleague 5 Work colleague 6 Other(specify) Don't know 8 No response 9

Section4: Lifetime risks-Health practices

No.	Questions and Filters	Coding categories
401	Have you ever had any of the following?	Y N Blood transfusion 1 2 Piercing any body part 1 2 Razor blade incision 1 2 Scarification 1 2 Tattooing 1 2
402	Have you ever had a vaccine?	Yes 1 No 2 Don't know 88
403	What vaccinations have you received?	Y N Tetanus 1 2

		Diphtheria 1 2 Polio 1 2 Measles 1 2 Tuberculosis 1 2 Yellow fever 1 2 Meningitis 1 2 Hepatitis 1 2 Other (specify)
404	Have you ever had any of the following symptoms?	Y N Painful genital ulcer 1 2 Painless ulcer 1 2 Discharge 1 2 Warts 1 2 Blisters 1 2 Lymph nodes 1 2 Urination 1 2 Refused 88 Don't know 99
405	Have you ever had a sexually transmitted infection?	Yes 1 No 2 Refused 88 Don't know 99
406	Which sexually transmitted infections have you had? (probe for all showing the pictures)	Y N Syphilis 1 2 Gonorrhoea 1 2 Chancroid 1 2 Lymphogranuloma 1 2 Herpes simplex 1 2 Genital warts 1 2 Yes ,but not specified 1 2 Refused 88 Don't know 99
407	Did you see a doctor or visit a hospital for this infection?	Yes 1 No 2 Refused 88 Don't know 99
408	For this infection, what kind of hospital or facility did you visit?	WSSF Clinic 1 WSSF Polyclinic 2 Hospital 3 Drug vender 4 Traditional healer? 5 Other 6
409	Have you ever treated yourself with antibiotics for a sexually transmitted infection without going to a health facility?	Yes 1 No 2 Refused 88 Don't know 99

Section 5: Male and female condoms

No.	Questions and Filters	Coding categories
501	Have you ever heard of a male condom?	Yes 1 No 2 Don't know 88

		No response 99
502	Have you and a sexual partner <i>ever</i> used a condom? (The respondent may not have used a condom with partners in sections 4-6, but may have used a condom at some other time in the past.)	Yes 1 No 2 Don't know 88 No response 99
503	Do you know any place or person where you can obtain condoms?	Yes 1 No 2 Don't know 88 No response 99
504	Which places or persons do you know where you can obtain condoms? PROBE Any others? CIRCLE 1 IF MENTIONED, 2 IF NOT MENTIONED	Y N 1. Shop 1 2 2. Pharmacy 1 2 3. Market 1 2 4. Private clinic 1 2 5. Health center/Hospital 1 2 6. Family planning center 1 2 7. Youth centers /clubs 1 2 8. Bar/guest house/hotel 1 2 9. Peer educator 1 2 10. School 1 2 11. Friend 1 2 12. Family 1 2 13. Street vendors 1 2 14. DKT 1 2 15. Sex worker 1 2 16. OTHER _____ 99. NO RESPONSE

Section 6: Sexual history: commercial partners

No.	Questions and Filters	Coding categories
601	In the last 12 months have you had sex with your regular sexual partner	YES 1 NO 2 Dont know 88 No response 99
602	Think of the sex you had with your regular sexual partner recently, in the last 30 days how many times you had sex with this woman ?	Number _____ 88 I don't know 99 No response
603	The last time you had sex with a regular partner, did you and your partner use a condom?	Yes 1 No 2 Don't know 88 No response 99
604	Who suggested condom use that time?	Myself 1 My partner 2

	CIRCLE ONE	Joint decision 3 Don't know 88 No response 99
605	Why didn't you and your partner use a condom that time? CIRCLE 1 IF MENTIONED, 2 IF NOT MENTIONED	Yes No 1. Not available 1 2 2. Too expensive 1 2 3. Not comfortable initiating 1 2 4. Partner objected 1 2 5. In a hurry 1 2 6. Embarrassed to buy or ask for 1 2 7. Used other contraceptive 1 2 8. Didn't think it was necessary 1 2 9. Didn't think of it 1 2 10. Allergy/ Itching 1 2 11. I don't like it 1 2 12. I trust my partner 1 2 13. I was drunk 1 2 14. Don't trust condom as they transmit HIV 1 2 15. Due to lack of knowledge of applying Condom 1 2 16. Due to frequent breakage of condom 1 2 17. It reduces my sexual pleasure 1 2 18. Desire to conceive 1 2 19. Other _____ 88. Don't know 88 99. No response 99

Section 7: Sexual history: non-regular non-paying sexual partners

	Questions and Filters	Coding categories
Q701	In the 12 months have you has sex with commercial sexual partner?	
Q702	Think of the sex you had with your commercial sexual partner recently, in the last 30 days how many times you had sex with this woman ?	Number of times _____ Don't know 88 No response 99
Q703	The last time you had sex with, commercial sexual partner, did you and your partner use a condom?	Yes 1 No 2 Don't know 88 No response 99
Q704	Who suggested condom use that time? CIRCLE ONE	Myself 1 My partner 2 Joint decision 3 Don't know 88 No response 99
Q705	Why didn't you and your partner use a condom that time? CIRCLE 1 IF MENTIONED, 2 IF NOT MENTIONED	1. Not available 1 2 2. Too expensive 1 2 3. Not comfortable irritating 1 2 4. Partner objected 1 2 5. In a hurry 1 2 6. Embarrassed to buy or ask for 1 2

		7. Used other contraceptive 1 2 8. Didn't think it was necessary 1 2 9. Didn't think of it 1 2 10. Allergy/ Itching 1 2 12. I trust my partner 1 2 13. I was drunk 1 2 14. Don't trust condom as they transmit 1 2 15. Due to lack of applying a condom. 1 2 16. Due to frequent breakage of a condom 1 2 17. It reduces my sexual pleasure 1 2 18. Desire to conceive 1 2 19. Other _____ Don't know 88 No response 99
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Section 8: Sexual history: Sexual partners with whom you have had a relation for more than 12 months, but is not your spouse or live-in partner

No.	Questions and Filters	Coding categories
801	Have you had non-regular non-commercial sex partner during last 12 months	Yes 1 No 2 Don't know 88 No response 99 (If No pass to 808)
802	How long has been from the time the relation began ?	Above 1 year 1 From 6 month -1 year 2 Below 6 months 3
803	With what <i>frequency</i> did you and all of your non-regular, non-commercial partner(s) use a condom during the past 12 months?	Every time 1 Almost every time 2 Sometimes 3 Never 4 Don't know 88 No response 99
804	Think about your most recent non-regular, non-commercial sexual partner. How many days did you have sexual intercourse with this person over the last 30 days?	Number of days _____ Don't know 88 No response 99
805	The last time you had sex with non-regular, non-commercial partner, did you and your partner use a condom?	Yes 1 No 2 Don't know 88 No response 99 (If No pass to 807)
806	Who suggested condom use that time?	Myself 1 My partner 2 Joint decision 3 Don't know 88 No response 99

807	<p>Why didn't you and your partner use a condom that time?</p> <p>CIRCLE 1 IF MENTIONED, 2 IF NOT MENTIONED</p>	<p>1. Not available 1 2</p> <p>2. Too expensive 1 2</p> <p>3. Not comfortable irritating 1 2</p> <p>4. Partner objected 1 2</p> <p>5. In a hurry 1 2</p> <p>6. Embarrassed to buy or ask for 1 2</p> <p>7. Used other contraceptive 1 2</p> <p>8. Didn't think it was necessary 1 2</p> <p>9. Didn't think of it 1 2</p> <p>10. Allergy/ Itching 1 2</p> <p>12. I trust my partner 1 2</p> <p>13. I was drunk 1 2</p> <p>14. Don't trust condom as they transmit 1 2</p> <p>15. Due to lack of applying a condom. 1 2</p> <p>16. Due to frequent breakage of a condom 1 2</p> <p>17. It reduces my sexual pleasure 1 2</p> <p>18. Desire to conceive 1 2</p> <p>19. Other _____</p> <p>Don't know 88</p> <p>No response 99</p>
(Ask of men):		
808	<p>We've just talked about your female sexual partners. Have you ever had any male sexual partners?</p>	<p>Yes 1</p> <p>No 2</p> <p>No response 99</p> <p>(If No pass to 901)</p>
809	<p>Have you had sexual intercourse with any of your male partners in the past 12 months? (Sexual intercourse defined as penetrative anal sex)</p>	<p>Yes 1</p> <p>No 2</p> <p>No response 99</p>
810	<p>How many male partners have you had anal intercourse with in the last 12 months?</p>	<p>Number of male partners _____</p> <p>Yes 1</p> <p>No 2</p> <p>No response 99</p>

No.	Questions and filters	Coding categories
901	Have you ever heard of HIV or the disease called AIDS?	Yes 1 No 2 No response 99
902	Can people protect themselves from HIV, the virus that causes AIDS, by using a condom correctly every time they have sex?	Yes 1 Yes, but less than 100 % 2 No 3 Don't know 88 No response 99
903	Can a person get the HIV from Mosquito bites?	Yes 1 No 2 Don't know 88 No response 99
904	Can a person get the HIV from eating raw meat prepared by a person infected by HIV?	Yes 1 No 2 Don't know 88 No response 99
905	Can a person get the HIV by getting injections with a needle that was already used by someone else?	Yes 1 No 2 Don't know 88 No response 99
906	Can people protect themselves from the HIV by having one uninfected faithful sex partner? (Excluding other transmission routes i.e. blood transfusion, contaminated sharp instruments)	Yes 1 No 2 Don't know 88 No response 99
Stigma and discrimination		
907	Can people protect themselves from the HIV by abstaining from sexual intercourse? (Excluding other transmission routes i.e. blood transfusion, contaminated sharp instruments)	Yes 1 No 2 Don't know 88 No response 99
908	If a relative of yours became ill With HIV, the virus that causes AIDS, would you be willing to care for him/her in your household?	Yes 1 No 2 Don't know 88 No response 99
909	If a worker in this company has HIV but is not sick, should he or she be allowed to continue working in the company?	Yes 1 No 2 Don't know 88 No response 99
910	What are your chances of getting infected with HIV?	No chance 1 Low 2 Moderate 3 High 4 Don't know 88 No response 99
911	If your response is NO or low , why?	Yes No 1. i never had sexual contact 1 2 2. Abstained from sexual intercourse 1 2 3. i trust my sexual partner 1 2 No injection with unsterile needles 5 1 2 I always use condom 1 2 6. healthy ; no contact with hiv infected person(s) 1 2)7. other _____ don't know 88 no response 99

912	If your answer is MODERATE or HIGH, why?	1. I had sexual contact with HIV positive partner 2. I had sexual contact with out condom 3. I had sex with multiple sexual partners 4. I had sex with commercial partner 5. Condom breakage 6. OTHER _____ Don't know 88 No response 99
Knowledge, opinions, and attitudes		
913	Can a pregnant woman infected with HIV or AIDS transmit the virus to her unborn child?	Yes 1 No 2 Don't know 88 No response 99
914	Can a woman with HIV or AIDS transmit the virus to her newborn child through breastfeeding?	Yes 1 No 2 Don't know 88 No response 99

Section 10: Exposure to interventions care and support

The target group has already received some kind of HIV/AIDS/STD prevention interventions. Specific questions designed to assess exposure would need to be developed locally.]

No.	Questions and filters	Coding categories															
1001	Have you heard any messages about HIV/AIDS on radio in the last 12 months?	Yes 1 No 2 Don't know 88 response 99															
1002	Have you seen any messages about HIV/AIDS on television in the last 12 months?	Yes 1 No 2 Don't know 88 No response 99															
1003	Have you seen or read any articles about HIV/AIDS in the print press (news papers/ magazines, etc.) in the last 12 months?	Yes 1 No 2 Don't know 88 No response 99															
1004	If you have a member of your family sick for a long time or an AIDS patient, how would you take care in handling body fluids like diarrhea, vomit, sputum and blood? READ OUT MORE THAN ONE ANSWER IS POSSIBLE CIRCLE 1IF MENTIONED, 2 IF NOT MENTIONED	<table border="0"> <tr> <td></td> <td>Yes</td> <td>No</td> </tr> <tr> <td>No special care</td> <td>1</td> <td>2</td> </tr> <tr> <td>Wash hands after care</td> <td>1</td> <td>2</td> </tr> <tr> <td>Use plastic gloves</td> <td>1</td> <td>2</td> </tr> <tr> <td>Ask someone else to help</td> <td>1</td> <td>2</td> </tr> </table>		Yes	No	No special care	1	2	Wash hands after care	1	2	Use plastic gloves	1	2	Ask someone else to help	1	2
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Use plastic gloves	1	2															
Ask someone else to help	1	2															

		OTHERS NO RESPONSE 99
1005	If a VCT (voluntary counseling and testing) service is available to you will you be willing to use it?	Yes 1 No 2 Don't know 88 No response 99

Section 11.VACCINE KNOWLEDGE AND WILLINGNESS TO PARTICIPATE

No.	Questions and filters	Coding categories
1101	A vaccine is a medicine to prevent illness.	Yes 1 No 2 Don't know 88 No response 99
1102	A vaccine is a medicine that cures from a disease.	Yes 1 No 2 Don't know 88 No response 99
1103	Some vaccines can be given as injections/shots	Yes 1 No 2 Don't know 88 No response 99
1104	Some vaccines can be taken by mouth as pills or liquids.	Yes 1 No 2 Don't know 88 No response 99
1105	Both children and adults can receive vaccines	Yes 1 No 2 Don't know 88 No response 99
1106	Some vaccines are made from the disease-causing organism.	Yes 1 No 2 Don't know 88 No response 99
1107	Vaccines are used for A) Measles B) Tetanus C) Malaria	A,b,c 1 A,b 2 A,c 3 B,c 4 Don't know 88 No response 99

1108	Everyone who gets a vaccine, such as the hepatitis vaccine or the influenza vaccine, is definitely protected from that disease.	Yes 1 No 2 Don't know 88 No response 99																																																		
1109	A vaccine is considered safe if it causes only minor problems like a mild fever, a sore arm or a headache.	Yes 1 No 2 Don't know 88 No response 99																																																		
1110	Often, several different vaccines against a particular illness need to be tested before one is found that works.	Yes 1 No 2 Don't know 88 No response 99																																																		
1111	In a study to test whether a vaccine/a medicine is effective, some volunteers will get the vaccine/medicine, but others will get a placebo (a substance that is not the vaccine/ the medicine).	Yes 1 No 2 Don't know 88 No response 99																																																		
1112	Do you believe that the government of Ethiopia must approve any vaccine trial that is done in Ethiopia?	Yes 1 No 2 Don't know 88 No response 99																																																		
1113	Do you know if there are any ongoing projects to make vaccines to prevent HIV/AIDS?	Yes 1 No 2 Don't know 88 No response 99																																																		
1114	Who would you trust to tell you that an HIV/AIDS vaccine was safe? Please tell us for each of the following	<table border="1"> <thead> <tr> <th></th> <th>Y</th> <th>N</th> <th>REF</th> <th>DK</th> </tr> </thead> <tbody> <tr> <td>A) Ministry of health</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>B) News papers_____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>C) Your employer_____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>D) Doctor_____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>E) Health care worker</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>F) Friends/relatives____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>G) Other, please specify _____</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y	N	REF	DK	A) Ministry of health	1	2	8	9	B) News papers_____	1	2	8	9	C) Your employer_____	1	2	8	9	D) Doctor_____	1	2	8	9	E) Health care worker	1	2	8	9	F) Friends/relatives____	1	2	8	9	G) Other, please specify _____														
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1115	If you do know of any attempts to make vaccines to prevent HIV/AIDS, how did you hear about these attempts?	<table border="1"> <thead> <tr> <th></th> <th>Y</th> <th>N</th> <th>REF</th> <th>DK</th> </tr> </thead> <tbody> <tr> <td>A) Newspapers_____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>B) Magazines _____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>C) Television _____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>D) Lectures/Courses____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>E) Radio_____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>F) Doctor _____</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>G) Health care worker__</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>H) Friend or relative__</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>I) Other, please specify</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y	N	REF	DK	A) Newspapers_____	1	2	8	9	B) Magazines _____	1	2	8	9	C) Television _____	1	2	8	9	D) Lectures/Courses____	1	2	8	9	E) Radio_____	1	2	8	9	F) Doctor _____	1	2	8	9	G) Health care worker__	1	2	8	9	H) Friend or relative__	1	2	8	9	I) Other, please specify				
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1116	People who are already infected with the HIV/AIDS virus cannot join an HIV vaccine trial.	Yes 1 No 2 Don't know 88 No response 99
1117	People who join a vaccine study can withdraw from the study at any time.	Yes 1 No 2 Don't know 88 No response 99

In the future, assume there may be one of the large trials of an HIV vaccine in Ethiopia after it has been proven to be a safe candidate vaccine in smaller trials.

No.	Questions and filters	Coding categories																																																																						
1118	If you were asked to join a HIV/AIDS vaccine study what things would you worry about.	<table border="1"> <thead> <tr> <th></th> <th>Y</th> <th>N</th> <th>REF</th> <th>DK</th> </tr> </thead> <tbody> <tr> <td>A) Pain from needles or injections.</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>B) Concern about needle, that it is not clean or that it is contaminated.</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>C) Concern about fever, aches, or pains after the injection.</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>D) Concern about what could happen in the weeks or months after an injection.</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>E) Worry you might get AIDS from the vaccine</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>F) My spouse/partner might not want me to take part</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>G) If I take part, others may think that I have AIDS</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>H) My family might not want me to take part</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>I) Time and travel necessary to be in a vaccine study</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>J) Having to sign a consent form</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>K) Worry that you might be given a placebo instead of the AIDS vaccine</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>L) Worry that you might test positive on the usual HIV test, even though you won't be infected with HIV.</td> <td>1</td> <td>2</td> <td>8</td> <td>9</td> </tr> <tr> <td>Other, please specify</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y	N	REF	DK	A) Pain from needles or injections.	1	2	8	9	B) Concern about needle, that it is not clean or that it is contaminated.	1	2	8	9	C) Concern about fever, aches, or pains after the injection.	1	2	8	9	D) Concern about what could happen in the weeks or months after an injection.	1	2	8	9	E) Worry you might get AIDS from the vaccine	1	2	8	9	F) My spouse/partner might not want me to take part	1	2	8	9	G) If I take part, others may think that I have AIDS	1	2	8	9	H) My family might not want me to take part	1	2	8	9	I) Time and travel necessary to be in a vaccine study	1	2	8	9	J) Having to sign a consent form	1	2	8	9	K) Worry that you might be given a placebo instead of the AIDS vaccine	1	2	8	9	L) Worry that you might test positive on the usual HIV test, even though you won't be infected with HIV.	1	2	8	9	Other, please specify				
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1119	Of the above concerns, which one would you rank as the most important concern that you have?																																																																							

1120	<p>What things would be important to you if you joined an HIV/AIDS vaccine trial?</p> <p style="text-align: right;">Y N REF DK</p> <p style="text-align: right;">A-Money. 1 2 8 9</p> <p style="text-align: right;">B-Every one gets a health insurance card for 5 years. 1 2 8 9</p> <p style="text-align: right;">C-Thinking that the vaccine would provide protection from HIV/AIDS. 1 2 8 9</p> <p style="text-align: right;">D-Admiration from friends and family. 1 2 8 9</p> <p style="text-align: right;">E-Knowing that you are helping society. 1 2 8 9</p> <p style="text-align: right;">F-Money to reimburse you for your time and travel to the vaccine clinic. 1 2 8 9</p> <p style="text-align: right;">G-The complete physical exam that will be given to you at the beginning of the study. 1 2 8 9</p> <p style="text-align: right;">H-Other, Please specify: _____</p>	
1121	Of the above concerns, which one is the most important reason to you? _____	
1122	If there were an HIV vaccine do you think people would have unprotected sex more often?	<p style="text-align: right;">True (Yes) 1</p> <p style="text-align: right;">False (No) 2</p> <p style="text-align: right;">Refused 8</p> <p style="text-align: right;">Don't know 9</p>
1123	Do you think that people who take part in HIV vaccine trials need to continue to protect themselves by using condoms, or by abstaining from casual sex, if they don't want to become infected with HIV?	<p style="text-align: right;">Yes 1</p> <p style="text-align: right;">No 2</p> <p style="text-align: right;">Refused 8</p> <p style="text-align: right;">Don't know 9</p>
1124	If we were to ask you to participate in a preventive HIV/AIDS vaccine study in the future, would you be likely to join? (Choose only one option)	<p style="text-align: right;">A) I would definitely want to join 1</p> <p style="text-align: right;">B) I would be likely to join 2</p> <p style="text-align: right;">C) I would be somewhat likely to join 3</p> <p style="text-align: right;">D) I would likely will not join 4</p> <p style="text-align: right;">E) I definitely would not join. 5</p>
1125	If an AIDS vaccine was determined to be safe and could prevent HIV/AIDS, how long is that you would want to get the vaccine? (Choose only one option)	<p style="text-align: right;">Year in number _____</p> <p style="text-align: right;">1/ Until the vaccine discovered</p> <p style="text-align: right;">88 I Don't know</p> <p style="text-align: right;">99 No response</p>

That is the end of our questionnaire.

Thank you very much for your time and effort in answering these questions taking time to answer these questions. We appreciate your help.

Annex II

Annex II : Behavioral survey, indicators for adults men and women

1. Knowledge of HIV prevention methods.

Numerator: Number of male /female respondents able to identify consistent condom use, mutually monogamy between HIV negative partners and abasing from sex as methods of reducing the risk of contracting HIV, in response to prompted question.

Denominator: total number of male/female respondents in survey.

2. No incorrect beliefs about AIDS transmission:

Numerator: Number of male /female respondents who in response to prompted questions correctly reject the two most common local misconception about AIDS transmission (mosquito bite, eating together with AIDS patient)

Denominator: total number of male/female respondents in survey.

3. Number of non-regular partner in last year: Which is the median number of sexual partner in the last 12 months who are not spousal or cohabiting and who are not commercial partner.

4. Condom use at last sex with non-regular, non-commercial partner.

Numerator: number of male / female respondents who used a condom the last time they had sex with a non-regular (non-spousal, non-cohabiting and non-commercial) partner.

Denominator: Number of male and female respondents who have had sex with at least one non-regular partner in the past 12 months.

5. Consistent condom use with non-regular, non-commercial partner

Numerator: number of male /female respondents who used a condom every time they had sex with any non-regular partner over the past 12 months.

Denominator: Number of male and female respondents who have had sex with at least one non-regular partner in the past 12 months.

6. Commercial sex in last 12 months (men only).

Numerator: Number of male respondents who have had sex with a female sex workers in the past 12 months.

Denominator: Total number of male respondents.

7. Number of commercial partner in the last year (men only): It is the median number of commercial sex partner in the last 12 months.

8. Condom use at last sex with a commercial partner.

Numerator: Number of male respondents who used a condom the last time they had sex with a commercial partner.

Denominator: Number of male respondents who have had sex with at least one commercial partner in the past 12 months.

9. Unprotected sex with a higher risk partner:

Numerator: Number of male /female respondents who reported not always using a condom with every non-regular partner and every commercial partner.

Denominator: total number of male /female respondents.

10. Population seeking voluntary HIV test:

Numerator: Number of respondents who have voluntarily requested an HIV

test, received the test and received their result.

Denominator. Total number of respondents.

ANNEX III
Map of Wonji Shoa Sugar Estate