



ARSI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF PUBLIC HEALTH

**Determinants of HIV Testing Among High School Students in Asella Town,
Arsi Zone, Southeastern Ethiopia, 2025 G.C.**

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Abstract

Background: HIV testing is a powerful tool for personal health and global public health, enabling early diagnosis, treatment, and prevention of HIV transmission. An estimated 39.9 million (36.1–44.6 million) people were living with HIV at the end of 2023, of which 1.4 million (1.1–1.7 million) children (0–14 years old). In Ethiopia, Africa's second most populous country, only 63% of HIV-positive youth 15–24 years are aware of their HIV-positive status after being tested for the first time.

Objective: This study aimed to assess the magnitude and determinants of HIV testing among high school students in Asella Town, Arsi Zone, Southeastern Ethiopia, in 2025 G.C.

Method: An institution based cross-sectional study was implemented among high school students in Asella town, 2025. The target population included high school students attending schools in Asella town. With a lottery method representing schools (one Governmental, one public and one private) were selected and the students from grades 9-12 were the study units. With a multi stage stratified sampling technique 568 students were recruited. Data was collected using a standardized questionnaire translated into Amharic and back-translated for accuracy. Data analysis involved both descriptive and analytical statistics. After data collection, the data was coded, entered and analyzed by using Epi info 7.2.5 and SPSS version 26 software. Binary logistic regression analysis was employed to control for potential confounding factors and to identify the independent effects of the explanatory variables on HIV testing among high school students. Adjusted odds ratios with 95% confidence intervals were reported to quantify the strength of associations together with their p values.

Results : Students who report experiencing peer pressure are 37 times more likely to undergo HIV/AIDS testing compared to those who do not report experiencing peer pressure (AOR = 36.98, 95% CI 28.78, 42.72, $P < 0.001$). Being tested for HIV prior to intercourse is 22 times more likely to happen than being tested without the possibility of intercourse happening in the near future (AOR = 22.04 , 95% CI 15.21, 28. 23, $P < 0.001$). History of prior sexual intercourse (AOR = 5.89, 95% CI: 2.03, 11.99, $P < 0.001$) and Alcohol consumption (AOR = 3.68, 95% CI 1.25, 8.87, $P = 0.008$) were also found to be associated with likeliness of being tested for HIV/AIDS among high school students.

Conclusion and Recommendation: HIV testing among high school students was a common occurrence (60.27%). The independent determinants that were identified here were grade level, history of prior intercourse, testing prior to having sex, alcohol consumption and peer pressure regarding HIV/AIDS. Testing prior to having sex, strong youth groups in high schools and having guidance counsellor with test kits being readily available for testing are highly recommended.

Keywords: HIV testing, High school students, Ethiopia

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List of Abbreviations

ALHIV - Adolescents Living with HIV

AGYW - Adolescent Girls and Young Women

AIDS - Acquired Immunodeficiency Syndrome

HIV - Human Immunodeficiency Virus

PMTCT - Prevention of Mother-To-Child Transmission

SSA - Sub-Saharan Africa

WHO - World Health Organization

1. Introduction

1.1 Background

HIV testing is a procedure that determines if a person has been infected with the human immunodeficiency virus (HIV). It involves detecting the presence of HIV-specific antibodies, antigens, or viral genetic material (RNA or DNA) in a sample of blood, saliva, or urine. The primary purpose of HIV testing is to diagnose HIV infection and provide access to treatment and care services(1,2).

An estimated 39.9 million (36.1–44.6 million) people were living with HIV at the end of 2023, of which 1.4 million (1.1–1.7 million) children (0–14 years old). 38.6 (34.9–43.1 million) adults (15+ years old) (3).

Among the 3.9 million young people living with HIV worldwide, 78% were living in SSA. An estimated 37% of new HIV infections were among adolescents and young adults (15–24 years) in SSA. Young women in the countries with a high burden of HIV infection are twice as likely as young men to acquire HIV infection (4).

In Sub-Saharan Africa, adolescent girls and young women (AGYW) aged 15-24 are at a high risk of acquiring HIV. Approximately six out of seven new HIV infections occur among adolescents aged 15-19 years, and young women in this age group are twice as likely to be living with HIV compared to their male counterparts. In 2019, four times as many adolescent girls were newly infected with HIV in Sub-Saharan Africa compared to adolescent boys. While there has been a decrease in HIV incidence since its peak in 1996, AGYW remain a key population for HIV epidemic control (5).

Worldwide, there are more than one billion people within the ages of 15–24 years, most of whom live in developing countries. Young people constitute one-third of the total population in Ethiopia. This number is expected to grow from 20.3 million in 2000 to 25 million in 2010 (6).

In general, young people are at a high risk of HIV/AIDS and other reproductive health problems. They generally exhibit behaviors and personality patterns due to biological, psychological, sociocultural and economic factors that are peculiar to their age-cohort. Lack of feeling of mutuality in heterosexual relationship, the tendency for using young girls for immediate sexual gratification, and superficial closeness in the context of randomized sexual relationship are the problems reported by young male (7). It is a transition period in life from dependent childhood to self-reliant adulthood for joining the labour force. It is at this period that young persons achieve the highest stage of cognitive and physical

development and strive to define their self-identity. A need for independence is also one of the features of this age-group, which sometimes may be associated with behaviors of rebelliousness, running away from home, giving up schooling, and even getting married without necessary preparation and parental consent (8).

HIV testing is crucial for high school students because it helps them understand their status, potentially access treatment and support early, and prevent further transmission of the virus. Early diagnosis and treatment can significantly improve the health and longevity of those living with HIV, and testing allows for timely intervention to reduce the spread of the virus within the student population. Understanding the predictors of HIV testing in this age group could support the national HIV programme to update the current health policy for youth in order to increase HIV testing coverage (7,8).

The beneficiary-initiated or provider-initiated HIV counselling and testing is recommended for youth who seek care in health centers. Furthermore, community-based HIV testing and HIV self-testing strategies have been available since 2016 for adolescents and young adults from key populations (men who have sex with men, people who inject drugs, female sex workers) and for youth who do not routinely use health services or do not want to be tested at a health facility. Despite these efforts, only 27.3% of young people (15–24 years) reported to know their HIV status in 2017 (9,10).

1.2 Statement of the problem

Low-income and middle-income countries continue to carry a disproportionate burden of the HIV epidemic. Sub-Saharan Africa (SSA) was home to 71% of all people living with HIV (20.1 million), 75% of AIDS-related deaths and 65% of new infections occurred in this region in 2017 (9).

The first evidence of HIV epidemic in Ethiopia was detected in 1984. Since then, HIV/AIDS has claimed the lives of millions and has left behind hundreds of thousands of orphans. The HIV epidemic in Ethiopia is characterized as mixed, with wide regional variations and concentrations in urban areas, including some distinct hot spot areas driven by key and priority populations. According to the EDHS done in 2016, the national adult (15-49) HIV prevalence is 0.96%: the urban prevalence was 2.9%, which is seven times higher than that of the rural (0.4%). National HIV Related Estimates and Projections (2020), also shows that the HIV prevalence varies from region to region ranging from less than 0.15% in Ethiopia Somali to 4.13% in Gambella (10).

The Ethiopia national HIV program has implemented several strategies to increase efforts to identify untreated cases of HIV. These strategies mainly employ provider-initiated case finding and social

networking testing. The services offered within these strategies, index case testing and partner notification, have historically targeted the married partners and biological children of HIV-positive individuals. The national program also recommends the availability of youth-friendly HIV testing and counseling (HTC) services; however, the nature of these youth-friendly services is not clearly defined. With only 63% of HIV-positive youth in Ethiopia aware of their status, the current national HIV testing strategies may be missing undiagnosed, HIV-positive youth (11).

Studies conducted in different parts of Africa, including Ethiopia, have shown that most youths indulge in risky sexual behaviour at an early age, often with little regard to the possible consequences. Sexual commencement at an early age with limited insight as to the consequences and the low rate of consistent condom-use are among the factors putting youths at a risk of HIV/AIDS. This situation is also further aggravated by the overall socioeconomic environment and the prevalence of harmful traditional practices (12).

In 2019, the national HIV incidence rate in the adult population is estimated at 0.02% (0.03% in females and 0.02% in males) with an estimated total of 15,000 (9,000 females and 6,000 males) new infections in 2019. The majority (67%) of the new infections are occurring in the age group below 30 years; in that age group, the highest (20% of all new infections) occur in the age group 20-24. There is a six fold higher incidence in women aged 15-19 than men; and a twofold greater incidence among women aged 20-24 years (13).

In 2024, it's estimated that approximately 605,238 people in Ethiopia were living with HIV. This figure represents a slight decline from the 610,350 estimated in 2022. Additionally, there were an estimated 7,000 new HIV infections and nearly 9,300 deaths from AIDS-related illnesses in 2024 (14).

According to a publication by Ethiopian public health institute in 2024, in Asella, there are approximately 4,324 people living with HIV, with 3,984 of them being adults over 15 years old. Specifically, Asella Hospital and Asella Health Center serve a portion of this population, with 3,356 and 628 PLHIV respectively, according to a 2020 study (15).

Lack of media access, lack of comprehensive knowledge about HIV and having discriminatory attitudes were the barriers to HIV testing practice on high school students. Marriage, secondary or higher education attainment, and high wealth index category were the facilitators for HIV testing (16).

A recent study found that low HIV status awareness among the youth could be attributed to stigma and discrimination and poor healthcare worker attitude. The study also concluded that distance of health facility to be one of the deterring factor (17).

Coming to our set up, there still have not been a single documented data in recent years, if any, suggesting what the reason behind the poor uptake of HIV testing among high school students and what are the determinants leading to it.

Recent EDHS publication shows that there is an increase in incidence of HIV among high school aged students in Asella town. But the reason behind the increasing rate of infection is yet to be determined (4).

Despite widespread knowledge about HIV transmission, many students engage in risky behaviors and lack consistent condom use, leading to continued new infections. Stigma, lack of consistent access to youth-friendly services like counseling and testing, and insufficient implementation of school-based prevention programs further exacerbate the issue, creating a critical public health challenge that demands better-integrated and evaluated educational strategies and supportive environments within schools (16).

Human Immunodeficiency Virus (HIV) continues to be a significant public health concern globally and locally, and adolescents, particularly high school students, represent a vulnerable group. Despite advancements in education and prevention, many high school students lack accurate knowledge about HIV transmission, prevention, and treatment (17)

While the overall prevalence may vary by region, a concerning trend is the influence of various determinants—such as low levels of awareness, peer pressure, risky sexual behaviors, substance abuse, socio-economic conditions, and limited access to youth-friendly health services on students' vulnerability to HIV (15).

In many cases, cultural taboos, stigma, and gaps in comprehensive sex education further compound the problem, leaving students ill-equipped to make informed choices. Despite existing prevention efforts, the interplay of these determinants continues to drive new infections among youth. Identifying and understanding these contributing factors is essential for developing targeted interventions that effectively address the root causes of HIV risk in high school populations (16).

1.3 Significance of the study

This study investigating determinants of HIV testing among high school students in Asella town is justified by significant burden HIV infection both world wide and in our country. It's a public health concern which is dramatically increasing in recent times. This study will provide inside information regarding the attitude and decision making of high school students regarding HIV testing and what factors are associated in the decision of being tested or not.

HIV/AIDS is one of the leading causes of morbidity and mortality world wide among all age groups. Global burden of disease study consistently ranks HIV among top causes of illnesses leading to mortality and morbidity.

Studies conducted in different parts of Africa, including Ethiopia, have shown that most youths indulge in risky sexual behaviour at an early age, often with little regard to the possible consequences (15).

It will also bridge the gap since there are no recent litterateurs which are focused on this topic in the area being studied.

2. Literature Review

2.1 Magnitude of HIV testing

Globally, 39.9 million (36.1–44.6 million) people were living with HIV at the end of 2023. An estimated 0.6% (0.6-0.7%) of adults aged 15–49 years worldwide are living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions (1).

The WHO African Region remains most severely affected, with one in every 30 adults (3.4%) living with HIV and accounting for more than two-thirds of the people living with HIV worldwide (1).

Approximately 86% of people living with HIV globally knew their HIV status in 2023. About 5.4 million people did not know they had HIV and still needed access to HIV testing services. HIV testing is an essential gateway to HIV prevention, treatment, care, and support services. The global target for HIV status awareness is 95% by 2025 (18).

In Africa, HIV testing prevalence ranges from 10% in Burkina Faso to 69.9% in Malawi [6, 7]. The prevalence of HIV testing among men in Sub-Saharan Africa is 53.5% [8]. This variation in HIV testing among different regions is due to the difference in lifestyle, cultural beliefs, quality and availability of HIV testing services, and knowledge about HIV/AIDS across different countries (19).

HIV testing uptake in sub-Saharan Africa has seen a significant increase, with a pooled prevalence of 65.01% among adults. However, variations exist across regions and countries, with some like Uganda showing high uptake (82.51%) while others like Guinea exhibit low rates (16.08%). Factors influencing testing uptake include age, education, urban versus rural residence, and the presence of risky sexual behavior (20).

In Ethiopia, a significant number of people are being tested for HIV, with over 10 million tests conducted annually on average. However, HIV testing uptake is still relatively low, with only 19.4% of adults aged 15-49 reporting having been tested in the past 12 months and receiving results, according to a scientific report. Factors like age, education, and risky sexual behavior influence testing uptake, with some groups facing challenges like stigma or lack of awareness (21).

Ethiopia faces an epidemic among sub-populations and geographic areas, with an estimated overall HIV prevalence rate of 1.4 percent, based on testing a sample of 5,780 men and 5,300 women age 15 to 49 who gave informed consent. The reality in the actual population turns above 3.3%. Within the individual regions, this testing found the prevailing rate varied from 0.2 in the SNNPR to a high of 6.0 percent in the Gambela Region (18).

2.2 Determinants of HIV testing in adolescents

2.2.1 Socio-demographic and familial factors

Testing and linkage to care account for the largest drop off in the continuum of care among adolescents living with HIV (ALHIV). A significant proportion of ALHIV do not know their HIV status. Population-based surveys from 2015 to 2017 in selected countries in eastern and southern Africa revealed that only 46% of young people aged 15–24 were aware of their HIV status (22).

In 2019, only 27% of girls and 16% of boys aged 15–19 years were tested for HIV over a 12-month period and received their results in Eastern and Southern Africa. Low levels of HIV testing access and uptake by adolescents is leading to late diagnosis and late entry into care and treatment (23).

Studies show adolescents and young adults 15–24 years of age are more likely to engage in risky sexual behavior than older adults and have less frequent contact with the healthcare system, thus making HIV testing a challenge for this target population in sub-Saharan Africa. As of 2017, only 30% of 15–19 year olds in Tanzania reported getting tested and receiving their results, while 72% of 20–24 year olds reported getting tested and receiving their results (23).

Ethiopian youth make up 22% of the nation's total population, and as of 2018, the prevalence of HIV amongst this age group was 0.7%. Nationally, the HIV epidemic in Ethiopia is concentrated in the urban and more densely populated parts of the country, with an urban HIV prevalence of 4.2%, which is almost triple the national prevalence of 1.5%. The prevalence of HIV in Ethiopia is lower than that of neighboring countries such as Kenya (4.9%) and Uganda (5.3%) (24).

In a study done in Ethiopia, the results demonstrated that residence they live had significant association with men and women 15-49 years living in urban areas were 34.040 times higher odds of having HIV testing (AOR=34.040; 95% CI: 21.028–55.105) compared to men and women 15-49 years who had live in rural areas. (International Journal of Scientific Reports (25).

Low rates of HIV testing among youth are a key barrier to HIV prevention and treatment, only 9% of all high school students have ever been tested for HIV. Literature on HIV testing across sexually active

and sexually inactive youth has been limited; however, Kann et al. indicate that adolescent females have higher rates of testing than adolescent males. In the Youth Risk Behavior Survey (YRBS), self-reported HIV testing rates among females were 10.5% compared to 8.1% among males (26).

Studies conducted in Ethiopia reveal a higher prevalence of HIV among AGYW compared to men of the same age group and older women, especially among the highly vulnerable groups. Despite this high proportion, the uptake of HIV testing among AGYW remains low, with only 21.8% reporting testing in the past year. However, people living with HIV and those receiving antiretroviral therapy tend to engage in safer sexual behaviors (27).

Many new cases of HIV infection are also occurring within the 15–24-year-old age group. As of 2019, 15–24 year old sub-Saharan African youths make up 36% of all new HIV infections among adults 15 years and older. In 2017 alone, an estimated 290,000 new HIV infections occurred among those 15-24 years in Eastern and Southern Africa with two-thirds of these infections among young women. If not for the youth bulge, it is estimated that between 2010-2017, there would have been 340,000 fewer new cases of HIV among sub-Saharan African youth, aged 15-24 years. As the youth population continues to grow across sub-Saharan Africa, the greatest challenge to reaching HIV epidemic control will be the identification of new and untreated cases of HIV (28).

CDC data show declines in sexual risk behaviors among high school students from 2011 to 2021. Fewer students are currently sexually active. And fewer have ever had sex; down from 47% in 2011 to 30% in 2021. However, many youth engage in health risk behaviors and experiences that can result in unintended outcomes. According to CDC data, Condom use is down. Condom use among sexually active students decreased from 60% in 2011 to 52% in 2021. This decrease represents an increased health risk for HIV and STIs (29).

In Africa, health care services have primarily been used by the wealthier population. It has been pointed out in the current and previous studies that demographic and behavioral factors can contribute to lower rates of HIV testing among individuals from lower-income households (30).

The inability to afford the cost of HIV testing may be a reason why individuals in lower income households do not undergo HIV testing at the same rate as wealthier individuals. In Ethiopia, the costs per patient for voluntary counselling and testing were US\$5.06 for home-based testing, US\$6.55 for voluntary counselling and testing, and US\$3.35 for professionally initiated counselling and testing. This implies that individuals in lower socioeconomic households might face higher costs relative to their monthly income or be unable to afford the estimated HIV-testing costs, compared to richest individuals who have better financial resources (31).

2.2.2 Behavioral Factors

In Ethiopia, the prevalence of alcohol consumption varied from 16.7% to 72.6%. Evidence from a systematic review and meta-analysis revealed that the magnitude of alcohol consumption could be as high as 44.16% (32).

In a study conducted on youths of Gamo-Gofa, south west Ethiopia, alcohol users were almost four times more at risk to initiate sexual intercourse earlier than those who didn't use alcohol. This is similar to earlier findings where alcohol users were two times and three times more likely to initiate sexual intercourse earlier than non-users in Dessie town and Butajira town respectively (33).

Although the prevalence of cigarette smoking among adults in the United States has declined to approximately 20%, studies have consistently indicated that the prevalence of smoking among persons living with HIV infection remains 2- to 3-fold higher than that of the general population (33).

Prevalence of cigarette smoking in sub-Saharan Africa tends to be lower than in other parts of the world. However, while smoking rates are falling in many countries worldwide, they are increasing and projected to continue to increase on the African continent. Currently, sub-Saharan Africa exhibits substantial variation in smoking rates among countries; according to an earlier review of the literature, prevalence of smoking may range from 1.8% in Zambia to 25.8% in Sierra Leone, though limited data make these estimates uncertain (34).

There are a mounting number of studies on the relationship between HIV and smoking in high income countries. However, this relationship is still understudied within the context of sub-Saharan Africa. In addition, there is little discussion in the literature to date on tobacco use patterns and their correlates in Africa. A recent study by Mdege et al. found a positive association between HIV and tobacco (35).

2.2.3 Psychosocial factors

Being a member of a peer group is one of the primary experiences of adolescence. Generally, peer influence leads to engaging in risky behaviors such as substance use with some probability of negative consequences such as physical injury, social rejection, and financial loss. Indeed, peer pressure is regarded as one of the strongest determinants of juvenile delinquency. Peer pressure among boys and girls undermines healthy social norms and HIV prevention messages, including delaying sexual debut. Moreover, peer pressure may lead to transactional sexual activities exposing young people to sexually transmitted infections (STIs) (36).

Peer influence can play a significant role in encouraging HIV testing. Peer education, where individuals share their experiences and knowledge with others, can be effective in promoting testing, particularly in high-risk groups. Conversely, peer pressure can create negative perceptions about HIV testing and potentially discourage individuals from seeking it (37).

Peer education is a common strategy for preventing HIV and promoting health worldwide and typically involves recruiting members of a specific at-risk group to encourage members to change risky sexual behaviors and maintain healthy sexual behaviors. What distinguishes peer education from mass media programs is that there is more interpersonal interaction in both directions (38)

To illustrate, a study conducted in Indonesia showed a statistically significant relationship between peer pressure and sexual behavior among teenagers. Specifically, in the Indonesia study, the proportion of adolescents who were motivated to have sexual intercourse due to peer influence was 26.6%. A similar study by Wubet located similar results reporting a direct relationship between peer pressure and the consumption of alcohol (39).

2.3 Conceptual Framework

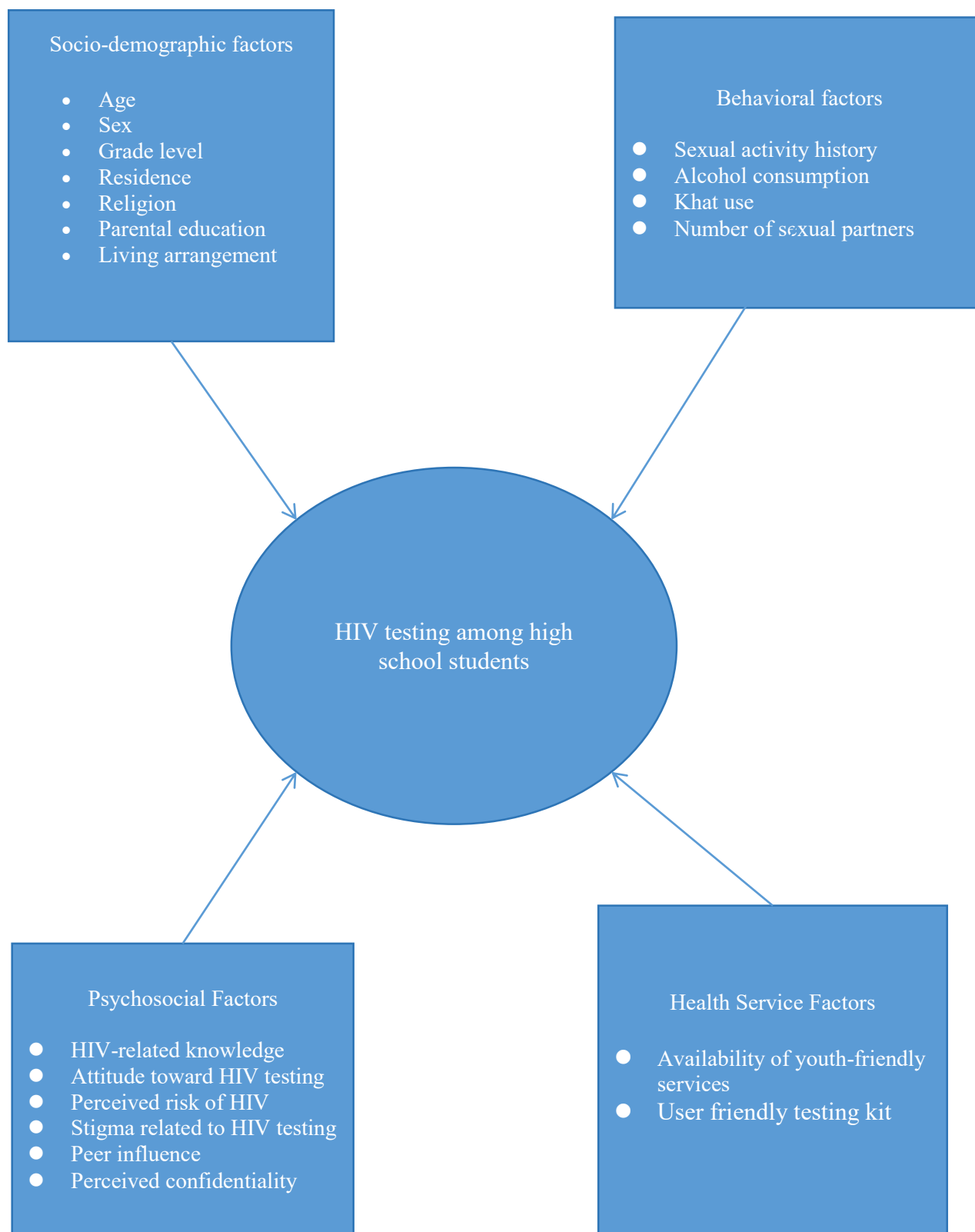


Figure-1 Conceptual framework for HIV testing and its determinants among high school students in Asella town, Arsi zone, Southeast Ethiopia, 2025 G.C (40).

3. Objectives

3.1 General Objective

- ❖ To assess the magnitude and determinants of HIV testing among high school students in Asella Town, Arsi Zone, Southeastern Ethiopia, in 2025 G.C.

3.2 Specific Objectives

- ❖ To determine the magnitude of HIV testing among high school students in Asella Town, Arsi Zone, Southeastern Ethiopia, in 2025 G.C.
- ❖ To identify factors associated with HIV testing among high school students in Asella Town, Arsi Zone, Southeastern Ethiopia, in 2025 G.C.

4. Methods and Materials

4.1 Study area

Asella town is found in Oromia region located 126Km south east from the capital city. This city has a latitude and longitude of 7°57'N 39°7'E with an elevation of 2430 meter above sea level (15). Asella is the capital of Arsi zone and according to Ethiopian statistical services agency, in July 2021 G.C, it was reported that Asella has a total population of 132,926 of whom 66,751 were women and 66,175 were men (15). There are 46 schools in the city, 32 of which are elementary schools and 14 of which are secondary schools, and 4 of them are high schools, according to data from the Asella Education Bureau. Asella Preparatory School, one of the high schools, is situated in Kebele 10 and will have 2,568 pupils in 2024–2025. Christian Horizon School, which has 998 pupils, is situated in Kebele 09. Three of the town's high schools will be the subject of the study. These educational institutions will be chosen to guarantee diversity in the socioeconomic backgrounds, school types, and student populations.

4.2 Study period and Period

An institution-based cross-sectional study design was employed among selected high school students in Asella Town. The study was conducted from May to December 2025.

4.3 Source and Study population

4.3.1 Source population

All students enrolled in high schools within Asella Town during the 2025 academic year.

4.3.2 Study Population

All students enrolled in the selected high schools in Asella Town and were present during the data collection period.

4.3.3 Inclusion and Exclusion Criteria

Inclusion Criteria

1. Enrolled in the selected schools in Asella town; Asella Preparatory School, St Gabriel School and Christian Horizon School.
2. Could provide assent; and
3. Who had caregivers that can provide consent for their child to participate.

Exclusion Criteria

1. Those who could not give assent or cannot provide consent from caregivers.
2. Those who were not students of selected schools.
3. Those with Intellectual disability and were limited to provide information.

4.4 Sample size and sampling procedures

4.4.1 Sample size determination

The sample size for this study was calculated using the single population proportion formula, based on a previously reported HIV testing proportion (P) of 36.4% (0.364) from research conducted elsewhere in Ethiopia. I took the following Considering the national meta-analysis and multiple regional studies: confidence interval CI= 95 % and marginal error (D) = 5% with a 10% non-response rate and design effect of 1.5 were used.

Therefore, based on the single population proportion formula

$$N = \frac{(Z_{\alpha/2})^2 p(1-p)}{D^2}$$

$$N = \frac{(1.96)^2 * (0.364(1-0.364))}{(0.05)^2}$$

N= 344 high school students from the selected schools were included in the study.

Adjusting for Design effect (1.5), $344 \times 1.5 = 516$

Taking 10% non response rate: $516 + ((10 \times 516)/100) = 567.6$, which was approximated to 568.

So, the final sample size was 568 students.

4.4.2 Sampling Procedure

A stratified multistage sampling technique was employed in this study.

◆ First stage (School selection):

All high schools in Asella Town were categorized into three strata based on ownership: government, private, and public schools. Since there were one school in each stratum, all three schools were included in the study.

◆ Second stage (Grade-level stratification):

Within each selected school, students were stratified by their grade level (Grades 9 to 12).

◆ Third stage (Gender stratification):

Further stratification was done by gender within each grade level.

Enrollment data for each stratum was obtained from the respective school's dean office. The total sample size was allocated proportionally according to the number of students in each stratum.

Finally, study participants were selected from each stratum using simple random sampling.

4.5 Study Variable

A. Dependent variable

HIV testing behaviour among Highschool students.

B. Independent Variables

- **Socio-demographic factors:** Sex, Age, Educational status, Parental education level, Income, Housing area
- **Behavioral factors:** Smoking, Alcohol drinking
- **Psychosocial factors:** Peer pressure

4.6 Data collection procedure

Data was collected by using structured questionnaires using face to face interview on selected high schools. The questionnaire was prepared in English and was created with Kobo tool box. The first draft of questioner was submitted to my advisers for comments, suggestions and was re-corrected again by me and resubmitted again to my advisors. Ten (10) data collectors (teachers) were participating on data collection and one supervisor was participating in supporting role.

4.7 Data Analysis Procedure

Data analysis involved both descriptive and analytical statistics. After data collection, the data was be coded, entered and analyzed by using Epi info 7.2.5 and SPSS version 26 software. Descriptive statistics was used to calculate the magnitude of HIV testing among high school students and to describe the characteristics of the study population, including age, sex, family background, and other relevant demographic and familial variables. The prevalence of associated factors, such as educational level, peer pressure, awareness, will also be summarized. For analytical statistics, appropriate statistical tests, including chi-square tests, and binary logistic regression analysis were employed to control for potential confounding factors and to identify the independent effects of the explanatory variables on HIV testing among high school students. Adjusted odds ratios with 95% confidence intervals were reported to quantify the strength of associations.

4.8 Data Quality Assurance

To ensure high data quality, several measures were implemented throughout the study. During questionnaire development, a standardized instrument for assessing HIV testing among high school students was utilized. The questionnaire was translated into the Afan Oromo language, followed by back-translation to confirm accuracy and maintain the original meaning. A pilot test of the questionnaire was conducted to identify and address any potential ambiguities or comprehension issues before full data collection begins. For data collection itself, data collectors underwent thorough training on the study protocol and standardized data collection methods. Supervision of data collection activities were ongoing to minimize errors and ensure consistency. Finally, during data entry and cleaning, a pre-designed data entry form or database was employed to reduce data entry errors. Subsequent data cleaning and validation procedures were performed to identify and rectify any inconsistencies or missing data, further enhancing the overall quality of the data set.

4.9 Ethical Consideration

Ethical approval was obtained from Research Ethical Review Committee of college of Health sciences of Arsi University, Department of Public Health. Furthermore, informed consent was obtained from each participant after thoroughly explaining the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time without consequence. Throughout the study, the confidentiality and anonymity of participants' data were meticulously maintained. All data collected were stored securely and accessed only by authorized personnel.

4.10 Dissemination Plan

The result of the study will be disseminated to Arsi University, College of health Science, Department of Public Health staffs and invited guests at symposium. Discussion will be with high school administrates. Finally written documents will be submitted to Arsi University, Department of Public Health, high schools in Asella town and Asella education bureau. An article will be published for future further studies and intervention use.

5. Results

5.1 Demographic characteristics

A total of 567 adolescents were included yielding a high response rate of 99.8%. Of these, 295 (52.05%) were female and 272 (47.95%) were male. The mean age of participants was 16.71 ± 1.00 years, with the largest proportion aged 16 years (32.9%).

With regard to grade level, 147 students (26.03%) were in grade 10, 140 (24.66%) in grade 10, 140 (24.66%) in grade 11, and 140 (24.66%) in grade 12. Participants were drawn from three school types: public school (Asella secondary school no 1) accounted for 189 students (33.3%), followed by private school (Marvel) with 189 students (33.3%), and NGO-owned school (St Gabriel) with 189 students (33.3%).

Most respondents reported living with both parents, 327 (57.53%). Those who lived with their relatives were 124 (21.92%) and the remaining 116 (20.55%) lived alone (rent).

Regarding parental education, 47.95% of fathers had completed secondary school, and 50.68% had higher education, while 1.37% had primary education. For mothers, 19.18% had primary education, 35.62% had secondary education, 45.21% had higher education.

Household income distribution indicated that 304 households (53.42%) fell within the high-income group ($>30,000$ birr), 257 (45.21%) were in the middle- income category(10,000–30,000 birr), and 121 (22.2%) were classified as low-income ($<10,000$ birr). The majority of students, 498 (87.7%), reported having siblings.

Table 1:Demographic representation for HIV testing and its determinants among high school students in Asella town, Arsi zone, Southeast Ethiopia, 2025G.C

Variable	Response	Frequency	Percent (%)
Sex	Male	272	47.95
	Female	295	52.05
Age (in Yrs)	15	70	12.3
	16	187	32.9
	17	179	31.5
	18	101	17.8
	19	30	5.5
Grade	Grade 9	140	24.66
	Grade 10	147	26.03
	Grade 11	140	24.66
	Grade 12	140	24.66
School Type	Public school	189	33.33
	Governmental	189	33.33
	Private school	189	33.33
Living arrangement	Lives with his family	327	57.53
	Lives with relatives	124	21.92
	Lives alone (rent)	116	20.55
Siblings	Yes	498	87.7
	No	69	12.3

5.2 HIV test uptake

342 (60.27%) of the 567 respondents had an HIV/AIDS test. Of them, 132 (38.85%) had tests within the previous six months, and 163 (47.82%) had tests within the previous year. The remaining 47 (13.66%) underwent testing within the previous three months. Of the 342 respondents who were tested, 171 (50%) were tested for blood donation purposes. 85 (25.01%) were tested before sexual intercourse, and 62 (18.12%) were tested to determine their serostatus.

280 (49.32%) of the 567 respondents had sexual intercourse. Of these, 155 (55.35%) were screened before intercourse. 23 respondents (8.21%) reported to have several sexual partners.

Table 2: HIV test uptake for HIV testing and its determinants among high school students in Asella town, Arsi zone, Southeast Ethiopia, 2025G.C

Variable	Response	Frequency	Percent (%)
HIV/AIDS tested	Yes	342	60.27
	No	225	39.73
When was the test	In the past Year	163	47.82
	In the past 06 month	132	38.85
	In the past 03 month	47	13.66
Reason for the test	For Blood donation	171	50
	Prior to intercourse	85	25.01
	To know there serostatus	62	18.1
	After risky sexual encounter	8	2.3
	Others	16	4.6
Have you ever had Sex?	Yes	280	49.32
	No	267	50.68
Were you tested prior to intercourse?	Yes	155	55.35
	No	125	44.65
Multiple Sexual Partner	Yes	23	8.21
	No	257	91.79

5.3 Behavioral Factors

Among the 567 responses, 23 (4.05%) smoked. 264 (46.57%) of them drank alcohol. Out of the 264, 148 (56.03%) drank on occasion, while the remainder 116 (43.97%) drank seldom. Of the respondents who drank alcoholic beverages, 70 (26.52%) had sex after drinking, and none of them had been tested for HIV/AIDS before intercourse.

264 (46.58%) of respondents indicated they were occasionally pressured by their friends, 147 (26.03%) said they were frequently pressured by their peers, and 78 (13.7%) said they rarely felt pressure from their friends. Of those who felt pressure, 374 (65.75%) said it was about their social life, while 86 (15.07%) said it was about relationships.

405 (71.23%) of the respondents said they were pressured to do something they didn't want to do by their friends. 273 (79.82%) of respondents said they were tested for HIV/AIDS after their friends suggested they all get tested. Only 7.05% (40) had a dangerous sexual experience after their buddies encouraged it.

Table 3: Behavioral factors for HIV testing and its determinants among high school students in Asella town, Arsi zone, Southeast Ethiopia, 2025G.C

Variable	Response	Frequency	Percent (%)
Smoking	Yes	23	4.05
	No	544	95.95
Alcohol Consumption	Yes	264	46.57
	No	303	53.43
How frequently do you consume alcohol	Occasionally	148	56.03
	Rarely	116	43.97
Sex after drinking	Yes	70	26.52
	No	194	73.48
Were you tested prior to Sex after drinking alcohol	Yes	0	0
	No	70	100
Being HIV tested after Friends suggestion	Yes	273	79.82
	No	69	20.18

5.4 Factors associated with HIV/AIDS testing

Bi-variate logistic regression analysis was conducted to examine the association between categorical variables and HIV/AIDS testing. Variables with p-values <0.05 were considered statistically significant.

Grade level, history of intercourse, testing before sexual intercourse, alcohol consumption and friends/peers suggestion for testing were significantly associated with HIV/AIDS testing. However, Gender, age, type of school, family structure, parental education, smoking and household income showed no significant associations.

Table 4: Bi-variate analysis for HIV testing and its determinants among high school students in Asella town, Arsi zone, Southeast Ethiopia, 2025G.C

Variable	Response	Frequency (%)	AOR (95% CI)	COR (95% CI)	P Value
Age	15	70(12.3%)	8.705 (7.5,10.65)	9.41 (8.1, 11.17)	0.52
	16	186(32.9%)			
	17	178(31.5%)			
	18	101(17.8%)			
	19	32(5.5%)			
Gender	Female	295(52.05%)	1.12 (0.87,2.12)	0.978 (0.38 ,2.5)	0.963
	Male	272(47.95%)			
Grade Level	9	140(24.66%)	2.39 (0.87,4.36)	2.49 (0.97 ,4.70)	< 0.001*
	10	147(26.03%)			
	11	140(24.66%)			
	12	140(24.66%)			
School Type	Public	189(33.33%)	1.49 (1.21,1.76)	1.65 (1.32 ,1.98)	0.647
	Gov'tal	189(33.33%)			
	Private	189(33.33%)			
Family Residence	Urban	458(80.77%)	1.03 (0.24,3.75)	1.17 (0.36, 3.82)	0.79
	Rural	109(19.22%)			
Siblings	Yes	498(87.7%)	2.58 (2.26,3.98)	2.73 (2.38,3.03)	0.25
	No	69(12.3%)			
Household income	Low	8(1.41%)	2.19 (1.87,2.5)	2.32 (2.01,2.66)	0.313
	Medium	256(45.14%)			
	High	303(53.43%)			
History of intercourse	Yes	280(49.32%)	5.89 (2.03,11.99)	6.07 (2.11,12.44)	<0.001*
	No	267(50.68%)			

Testing prior to intercourse	Yes	155(55.35%)	22.04	22.1 (15.71,28.93)	< 0.001*
	No	125(44.65%)	(15.21,28.23)		
Smoking	Yes	23(4.05%)	0.98 (0.89,1.11)	1.07 (0.99 ,1.16)	0.151
	No	544(95.95%)			
Alcohol	Yes	264(46.57%)	3.68 (1.25, 8.87)	3.792	0.008*
	No	303(53.43%)		(1.37, 10.43)	
Testing after suggestion by peers	Yes	273(79.82%)	36.98	38.66	<0.001*
	No	69(20.18)	(28.78,42.72)	(30.98,44.75)	

Key : * shows the variable has significant association.

Being a grade 10 student when compared to other grades was strongly associated with the uptake of HIV/AIDS among the respondents (AOR = 2.39, 95% CI:0.87,4.36 , P < 0.001).

History of prior sexual intercourse was found to increase the likelihood of being tested for HIV/AIDS 6 times when compared to respondents who has no prior history of intercourse (AOR = 5.89, 95% CI: 2.03,11.99, P < 0.001).

Being tested for HIV prior to intercourse is 22 times more likely to happen than being tested without the possibility of intercourse happening in the near future (AOR = 22.04 , 95% CI 15.21, 28. 23, P <0.001).

Alcohol consuming respondents were 3.7 times likely to be tested for HIV/AIDS than non-drinkers (AOR = 3.68, 95% CI 1.25, 8.87, P = 0.008).

When compared to respondents who does not respond to pressure, respondents who feel peer pressure are 38.66 times likely to be tested for HIV/AIDS than the others (AOR = 36.98, 95% CI 28.78 - 42.72, P < 0.001).

6. Discussion

This school-based cross-sectional study in Asella town found a significant prevalence of HIV/AIDS testing among high school students (60.27 percent). This figure exceeds Ethiopia's national projections. It is also greater than the projected statistics in comparative school tests conducted in Sub-Saharan Africa. (23, 24).

When compared to uptake of HIV testing among AGYW, with only 21.8% reporting testing in the past year, HIV testing in high schools found in Asella is three times more than among the AGYW (27).

When comparing grades nine to twelve, being a grade 10 student was significantly related with HIV/AIDS uptake among respondents. Unfortunately, this is inconsistent with previous study because there is no data on grade distribution in HIV testing.

In our respondent group, having a history of prior sexual intercourse increased the odds of being tested for HIV/AIDS six times. When we compare this study with a similar result done in Gamo Gofa, south west Ethiopia, the result is comparable, with their being 5 times more likely.

Being tested for HIV prior to intercourse is 22 times more likely to happen than being tested without the possibility of intercourse. When we compare the data to researches done on Dessie and Butajira, Our result is significantly higher than the other and shows there is a significant relation among HIV testing and possibility of intercourse in the near future(33).

Respondents who drank alcohol were 3.7 times more likely to get tested for HIV/AIDS than those who did not drink.. In a study conducted on youths of Gamo-Gofa, south west Ethiopia, alcohol users were almost four times more at risk to initiate sexual intercourse earlier than those who didn't use alcohol. This is consistent with previous findings, in which people who consumed alcohol were two and three times more likely

than those who did not drink to initiate sexual intercourse in Dessie and Butajira towns, respectively. The figure is likewise similar in terms of test uptake (33).

A study conducted in Indonesia showed a statistically significant relationship between peer pressure and sexual behavior among teenagers. Specifically, in the Indonesia study, the proportion of adolescents who were motivated to have sexual intercourse due to peer influence was 26.6%. A similar study by Wubet located similar results reporting a direct relationship between peer pressure and the consumption of alcohol . The result from our research suggested that when compared to respondents who does not respond to pressure, respondents who feel pressure are 38.66 times likely to be tested for HIV/AIDS than the others(39).

One of the limitation of this study was self report measure which can lead to bias due to memories not being recent or social desirability of the answers. This might lead to false interpretation of proposed associations with the variables and cause improper conclusion. Since it is a cross sectional study, it prevents causal inferences as well.

7. Conclusion

HIV testing was relatively widespread among high school students (60.27%). The independent factors identified here were grade level, history of prior intercourse, testing prior to having sex, alcohol intake, and peer pressure about HIV/AIDS. Although smoking was found to have a near-positive association, other factors such as income, residence, parental education levels, and having a sibling weren't associated with HIV/AIDS testing among respondents. Interventions include school-wide testing, easily accessible test kits, and a strong guidance counsellor in the school's proximity. Incorporating sex education classes and youth groups in schools will also result in a considerable increase in HIV testing.

8. Recommendation

On a personal level, I counsel students to be extremely cautious when having sex and to get tested with their partner beforehand. They also need to learn how to say no to their peers and abstain from frequent drinking with fellow students.

I strongly recommend that schools hire a qualified guidance counsellor to assist these youngsters who are getting close to adulthood. Teenagers may learn about HIV/AIDS and the value of being tested by starting youth clubs in schools and having strong leaders in these clubs.

In addition, the Health Bureau should implement a regular school-wide testing program or provide simple-to-use HIV/AIDS testing kits in schools or adjacent medical institutions.

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10. Annexes

Annex 1: Introduction to Participants

Title of the research project: Determinants of HIV testing Among High School Students in Asella Town, Arsi Zone, Southeast Ethiopia, 2025G.C.

I want to start by expressing my gratitude in advance for your cooperation and permission to take part in this study. Please review the study's general information and feel free to ask any questions you may have about the study.

The study's findings will serve as a baseline for creating suitable intervention plans aimed at enhancing the HIV testing habits of high school students. The self-administered form of the questionnaire will include closed-ended questions. As a result, I respectfully ask that you answer the questions honestly. It is not necessary that you provide your name or address. Your provided information is kept private and is solely utilized to further this research. Do not be afraid to ask the data collector any questions. For the study to be completed successfully, your cooperation and involvement are crucial until the questionnaire is completed.

Thus, I kindly request your sincere willingness. However, by clearly marking "No" in the box below, you have the option to decline if you are not willing to participate.

Are you a volunteer? Yes -----No ----

Thank you in advance for your cooperation.

Questionnaire code: _____

Persons to contact: If you have any question to ask, please contact:

Abel Tadesse (M.D)

Phone : +251910770649

Email : abeltadesse6100@gmail.com

Annex 2 : Consent and Assent Form for Adolescents Participating in Research Questionnaire

Title of the research project: Determinants of HIV testing Among High School Students in Asella Town, Arsi Zone, Southeast Ethiopia, 2025G.C

Investigator : Abel Tadesse (M.D)

Phone : +251910770649

Email : abeltadesse6100@gmail.com

1. Introduction

You have received an invitation to participate in a study. Information on the study is provided on this form, and participation is completely voluntary. Before determining whether or not you wish to participate, please carefully read it.

2. Purpose of the study

The purpose of this study is to assess HIV testing and its determinant factors in high school students. We want to learn more about the Determining factors of HIV testing among high school students of Asella town. Your responses will help us understand that.

3. Procedures

Should you consent to take part, you will be required to fill out a survey. It will take about 10 minutes to complete this questionnaire. Your feelings, opinions, and experiences regarding specific topics will be questioned. You are free to pause at any moment and are not required to respond to every question.

4. Risks and Discomforts

There are no anticipated risks associated with taking part in this research. You can, however, skip any questions or cease taking part altogether if you feel uncomfortable responding to any of them. Please notify the researcher right away if you feel distressed. Resources for assistance will be available if required.

5. Benefits

There may not be direct benefits to you for participating in this study. However, your participation will help us better understand determinants of HIV testing Among High School Students in Asella Town.

6. Confidentiality

Your answers will remain private and confidential. No publications or reports that come out of this study will contain any information that might be used to identify you. All information will be safely kept, and only approved research staff will be able to access it.

7. Voluntary Participation

Participation in this study is completely voluntary. You are free to decide not to participate or to stop at any moment without facing any repercussions.

8. Assent for Adolescents

Because you are under the age of 18, we require your consent to participate. You agree to your understanding of the study and your willingness to participate by signing below. Before, during, or after your involvement in the study, you are free to ask any questions you may have. Throughout the study, you can also seek for assistance whenever you need it.

9. Consent for parents or Guardians

If you are under 18, your parent or legal guardian must also give their permission for you to take part in this study. This separate consent form for parents/guardians is attached.

10. Contact Information

If you have any questions or concerns about the study, you can contact the investigator by the address given above.

Adolescent Assent

By signing below, I agree to participate in this research study. I understand that I can stop at any time, and that my participation is completely voluntary.

Participant's Name: _____

Participant's Signature: _____

Date: _____

Parent/Guardian Consent (if applicable)

I have been informed about this study and agree to allow my child to participate. I understand that they can withdraw from the study at any time.

Parent/Guardian's Name: _____

Parent/Guardian's Signature: _____

Date: _____

Annex 3: Questionnaire on determinants of HIV testing Among High School Students in Asella Town, Arsi Zone, Southeast Ethiopia.

Section 1: Socio-demographic Information

1. Age	____ (Please write in number)
2. Gender	1. Male 2. Female
3. Grade Level	1. Grade 9 2. Grade 10 3. Grade 11 4. Grade 12
4. Type of School	1. Private School 2. Public School
5. Residence	1. Rural 2. Urban
6. Housing	1. Lives with his/her parents 2. Lives with relatives/guardians 3. Lives alone (rent)
7. Siblings	1. Yes 2. No
8. If Yes to question 7, are they older than you?	1. Yes 2. No
9. Paternal Education level	1. No formal education 2. Primary School 3. Secondary School 4. Higher education
10. Maternal Education Level	1. No formal education 2. Primary School 3. Secondary School 4. Higher education
11. Income	1. Low: < 10,000 ETB 2. Medium: 10,000 - 30,000 ETB 3. High: > 30,000 ETB

Section 2: Behavioral factors

1. Have you been tested for HIV/AIDS before?	1. Yes 2. NO
2. If Yes to question 1, when was this?	1. In the past 01 month 2. In the past 03 month 3. In the past 06 month 4. In the past year 5. Morethan 01 year ago
3. If Yes to question 1, Why were you tested?	1. To know my serostatus 2. For blood donation purpose 3. Due to school wide testing 4. Prior to intercourse 5. After risky sexual encounter 6. Others
4. Have you ever had sex before?	1. Yes 2. No
5. If Yes to question 4, were you both screened for HIV prior?	1. YES 2. No
6. If Yes to question 5, When were you tested?	1. In the past 01 month 2. In the past 03 month 3. In the past 06 month 4. In the past year 5. Morethan 01 year ago
7. Do you have multiple sexual partners?	1. Yes 2. No
8. Have you ever smoked?	1. Yes 2. No
9. If Yes to question 8, how many smokes per day?	_____ (Write in Number)
10. Have you consumed any alcoholic beverages before?	1. Yes 2. No
11. If Yes to question 10, How Frequently do you drink?	1. Weekly 2. On occasions 3. Rarely
12. If Yes to question 10, have you had sex after drinking?	1. Yes 2. No

13. If Yes to question 12, Were you screened for HIV prior to intercourse?	1. Yes 2. No
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Section 3: Psycho-social Factors

1. How often do you feel pressured by your friends or peers?	1. very often 2. Often 3. Sometimes 4. Rarely 5. Never
2. In what situations do you feel the most peer pressure?	1. Academic 2. Social 3. Substance use 4. Relationships 5. Regarding Intercourse
3. Have you ever felt pressured to do something you didn't want to do because of your friends?	1. Yes 2. No
4. How comfortable are you saying "No" to your friends when you disagree with them?	1. very uncomfortable 2. Somewhat uncomfortable 3. Neutral 4. Somewhat comfortable 5. Very comfortable
5. Have you ever changed your behavior or opinions to fit in with your friends?	1. Yes 2. No
6. Have you been tested for HIV/AIDS after your friends suggest that you should all be tested?	1. Yes 2. No
7. Have you been involved in risky sexual encounter after it was suggested by your friends?	1. Yes 2. No
8. Have you been intoxicated after you were drinking with your friends by their suggestion?	1. Yes 2. No

Declaration of Investigator

I, the undersigned student of the Master of Public Health program, declare that this thesis is my original work, submitted in partial fulfillment of the requirements for the degree of Master of Public Health in General Public Health, to the best of my knowledge.

Name of investigator: Dr. Abel Tadesse

Signature:



Date: 12/12/2025

Declaration of Advisors

We, the undersigned, hereby declare that we have carefully reviewed this thesis and provided guidance for its preparation. We confirm that this thesis is ready for defense with our approval as the university advisor(s), and to the best of our knowledge, the work presented meets the academic standards and is in partial fulfillment of the requirements for the degree of Master of Public Health in General Public Health.

1. Name of Principal Advisor: Mesfin Tafa

Signature:



Date: 5/20/2025

2. Name of Co-Advisor: Dr. Gizachew Abdeta

Signature:



Date: 12/12/2025