



**ASRAT WOLDEYES HEALTH SCIENCE CAMPUS**

**DEPARTMENT OF PUBLIC HEALTH**

**MAGNITUDE OF SYPHILIS AND ASSOCIATED FACTORS AMONG  
PREGNANT WOMEN ATTENDING ANTENATAL CARE CLINIC IN DEBRE  
BERHAN TOWN PUBLIC HEALTH INSTITUTIONS, NORTH SHEWA ZONE,  
AMHARA NATIONAL REGIONAL STATE, ETHIOPIA.**

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WOMEN ATTENDING ANTENATAL CARE CLINIC IN DEBRE BERHAN TOWN  
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**JUNE 2023**

**DEBRE BERHAN, ETHIOPIA**

## DECLARATION

I the undersigned declare that this thesis work has never been presented in this or another university for graduation and that the source materials used in this research project have been dully acknowledged.

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>ANC</b>	Antenatal care
<b>FTA Abs</b>	Fluorescent treponemal antibodies absorption
<b>HIV</b>	Human immunodeficiency virus
<b>IUGR</b>	Intrauterine growth restriction
<b>RPR</b>	Rapid plasma reagent
<b>STI</b>	Sexual transmitted infection
<b>VDRL</b>	Venereal disease research laboratory
<b>WHO</b>	World health organization

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## ABSTRACT

**Background:** Syphilis is a disease caused by the bacteria *Treponemal pallidum*. Syphilis is a major cause of morbidity and mortality in pregnancy and it is one of the greatest public health challenges. Ethiopia is one of the countries with a high prevalence of Sexually transmitted infections. However, data on the extent of syphilis is limited.

**Objective:** This study aimed to assess the prevalence of syphilis and its associated factors among pregnant women attending antenatal Care Clinic in Debre Berhan Town Public Health Institutions, North Shewa Zone, Amhara National Regional State, Ethiopia.

**Methods:** A facility based cross sectional study was carried out among pregnant women attending antenatal care clinic. A total of 376 study participants were included in the study. The participants were chosen using systematic random sampling techniques. The data were collected using structured questionnaire and three data collectors took part in this study. Two milliliters of blood sample has taken to determine the prevalence of syphilis using Venereal Disease Research Laboratory (VDRL test). The data were entered in EPI data manager version 3.3 and analyzed using IBM SPSS Statistics version 22. Multiple logistic regression analysis was applied to describe. A Odds ratio with 95% confidence interval (CI) was determined to assess the strength of association. For all statistically significant tests p- value<0.05 was used as a cut-off point.

**Result:** A total of 362 study participants were successfully involved in the study yielding a response rate of 96.3%. Out of the study participants, 8 (2.2%) of pregnant women were found to be reactive to syphilis test. The prevalence of syphilis-HIV co-infection among pregnant women were 2 (0.55%). Participants who had no formal education were 25.54 times more likely to get infected with syphilis than those who had formal education (AOR=25.54, 95% CI: 1.63- 77.50). Having poor knowledge about syphilis (AOR=2.32, 95%CI: 1.27-12.42), previous history of STI (AOR=13.24, 95%CI: 1.95- 33.24) and reactive for HIV/AIDS (AOR=8.03, 95%CI:1.75-15.97) are significant predictors of syphilis.

**Conclusion and recommendation:** The present study showed syphilis was prevalent among the study participants. Therefore, effective health education program focusing on sexual transmitted infections should be provided at health facilities.

**Key words:** Syphilis, VDRL, sero prevalence, pregnancy, STI

# 1. INTRODUCTION

## 1.1 Background

Syphilis is a bacterial STI caused by *Treponema pallidum* that has a high morbidity and mortality rate. Syphilis is transmitted through sexual contact with infectious lesions of the mucous membranes or abraded skin, via blood transfusion, or transplacentally from a pregnant woman to her fetus (1).

Syphilis is one of the most common sexually transmitted infections globally, with approximately 6 million new cases each year. According to the World Health Organization (WHO), 376 million cases of four curable sexually transmitted infections (STIs) (chlamydia, gonorrhea, trichomoniasis, and syphilis) occurred annually in 2019(2). Globally, 36 million people are infected with syphilis, out of which 2 million are pregnant women. The prevalence of syphilis infection among pregnant women in sub-Saharan Africa is estimated to be 2.7%, which represents nearly 1 million pregnancies to be at risk annually (3).

More than half of infected women transmit the infection to their babies resulting in adverse pregnancy outcomes including early fetal death, stillbirth, preterm birth, low birth weight, neonatal death, and congenital infection in infants (4). Undiagnosed and untreated STIs can result in adverse reproductive health outcomes including infertility and ectopic pregnancy as well as adverse birth outcomes such as stillbirth and prematurity (5). The risk of congenital syphilis depends on the concentration of the etiological agent in the maternal bloodstream, which is higher during the primary and secondary phases.

Syphilis can be transmitted transplacentally from a pregnant woman to her fetus. Without treatment, maternal syphilis is estimated to result in adverse birth outcomes (ABOs) in 50%–80% of affected pregnancies (6).

Untreated syphilis during pregnancy can affect pregnancy outcome, resulting in spontaneous abortion, stillbirth, non-immune hydrops-fetalis, intrauterine growth restriction, premature delivery and perinatal death, as well as serious sequel in live born infected children (7, 8). Appropriate treatment of pregnant women often prevents such complication. Screening in the first trimester with VDRL and RPR test combine with confirmation of reactive individuals with

Treponema tests such as fluorescent Treponema antibody absorption (FTA-Abs) assay is a cost effective strategies.

## 1.2 Statement of the problem

Syphilis is an important cause of morbidity and mortality in pregnancy and it is one of the greatest public health challenges. It is responsible for up to 30% of perinatal mortality (9). Mother-to-child transmission of syphilis (congenital syphilis) is usually devastating to the fetus if maternal infection is not detected and treated sufficiently early in pregnancy. The burden of morbidity and mortality due to congenital syphilis is high. In 2012, an estimated 350 000 adverse pregnancy outcomes worldwide were attributed to syphilis, including 143 000 early fetal deaths/stillbirths, 62 000 neonatal deaths, 44 000 preterm/low-birth-weight babies and 102 000 infected infants(1).

Over 90% of syphilis infections occur in resource-limited countries (10). The prevalence of syphilis among pregnant women in Africa region was estimated to be 2% (11). In 2016, the World Health Organization (WHO) proposed a strategy to control and prevent sexually transmitted infections (STI). The goal was to reduce the burden of syphilis by about 90% and congenital syphilis to less than 40 cases per 100,000 live births (12).

Syphilis remained a major cause of reproductive morbidity and poor pregnancy outcomes in developing countries (13). In sub-Saharan Africa, syphilis sero-prevalence ranges from 4 to 15%, and can cause adverse outcomes in 50–80% of pregnancies (14). The public health burden resulting from adverse pregnancy outcomes due to syphilis infection among pregnant women not screened for syphilis in 43 countries in Sub-Saharan Africa. The estimated incidence of adverse pregnancy outcomes (APOs) was 205,901 per year, including stillbirth, neonatal death, low birth weight, and CS, resulting in approximately 12.5 million disability-adjusted life years (DALYs) (15).

Ethiopia is among the top three sub-Saharan countries with the highest numbers of adverse pregnancy outcomes attributed to syphilis. Furthermore, studies have demonstrated that 21% children born from seropositive mothers in Ethiopia developed signs of syphilis. Besides, stillbirth and abortion rates of syphilis diagnosed women were almost double relative to the general population (15).

Ethiopia is one of the countries in which STIs are highly prevalent. However, the data needed to present a realistic picture on the magnitude of syphilis are limited. Moreover, few studies conducted in Ethiopia reported different prevalence across the country. For instance, syphilis was

accounted for 2.7% and 2.2% of the STDs reported in the years 2008 and 2010, respectively (16).

Because of the high risky behaviors and transmission patterns of syphilis and HIV, the high prevalence of syphilis and HIV has been the sensitive problems among pregnant women in Ethiopia. Co-infection of syphilis and HIV leads an infected individual to more worsen conditions. In this situation, the underline knowledge of the extent of co-infection and associated risk factors is a vital tool for prevention and control of the infection among pregnant mother and it helps to estimate the potential of spread in the community. In addition, it is possible to minimize such events through continuous monitoring of the magnitude of the infection and estimating the potential risk for the infection in the community (13).

Different strategies have been developed for reducing the burden of syphilis (17). Global initiatives aimed to reduce the prevalence of syphilis by 90% and congenital syphilis to be less than 50 cases per 100,000 live births during the coming decade (18). Reaching the targets can reduce the burden of maternal syphilis by 8.5 million DALYs (15).

Therefore, the current study was conducted to assess the magnitude and associated factors of syphilis during pregnancy in Debre Berhan Town Public Health Institutions.

### 1.3 Significance of the study

Little has been studied about the prevalence of syphilis and its associated factors among pregnant women attending antenatal Care Clinic in Debre Berhan Public Health Institutions. This study was aiming to fill this gap by assessing the prevalence of syphilis and identifying associated factors among the pregnant women.

The implementation of strategies and policies to address syphilis and its serious sequel in pregnant women has been influenced by complex and multi-faceted risk factors. However, a few studies have been conducted on the magnitude of syphilis infection and its associated factors in pregnant women in Ethiopia, including in the Debre Berhan Town.

Assessing the magnitude of syphilis in pregnancy might contribute for better management by providing adequate information about the burden of this disease. Furthermore, studying the magnitude of the diseases might also design effective strategy to reduce syphilis transmission and adverse pregnancy outcomes due to untreated maternal syphilis. This study will also identify associated factors for syphilis this in turn will guide public health intervention and control measures.

Finally, this study might also serve as a baseline for further future research direction which may provide an essential information for the researchers, policymakers, and health professionals to guide and come up with new research, policies, and practices.

## 2. LITERATURE REVIEW

### 2.1 Magnitude of syphilis in pregnancy

Syphilis is caused by the spirochete *Treponema pallidum* subspecies *pallidum*, which is of particular concern during pregnancy because of the risk of trans-placental infection to the fetus. Stillbirths and early childhood mortality due to syphilis are continually being reported each year. World Health Organization (WHO) estimated that up to 1.5 million cases of syphilis in pregnancy occurs each year (19).

A study conducted on global prevalence and incidence estimates in 2016 indicated that global syphilis prevalence was 0.5%, (amounting to a total 6.3 million syphilis case) (20). More than 10 million people are infected with syphilis worldwide; most of these infections occur in sub-Saharan Africa and Asia. Annually, around 2 million pregnant women are estimated to have active syphilis infection while only less than one-tenth would be diagnosed and receive the treatment. More than 90% of these infections occur in resource limited settings (21, 22).

A systematic review and meta-analysis study conducted in Sub-Saharan Africa showed that the pooled prevalence of syphilis among pregnant women in Sub-Saharan Africa was 2.9%. According to this study, East and Southern African regions had higher syphilis prevalence among pregnant women (3.2%, and 3.6%) respectively) than even the Sub-Saharan African pooled prevalence(23).

Several studies in different parts of the world have shown that syphilis in pregnancy continuing as a public health concern. A report on global sexually transmitted infection surveillance indicated that the sero-prevalence of syphilis among ANC attendees was 0.8% globally. According to this report, in WHO regions of the Americas and African regions showed the sero-prevalence of syphilis was 0.7% and 2% respectively (24). A study done in Tanzania revealed that 2.5% of pregnant women attending ANC were seropositive for syphilis (25).

A recent systematic review and meta-analysis study conducted in Ethiopia showed that the pooled prevalence of syphilis among pregnant women in Ethiopia was 2.32% (26). Even though antenatal screening for syphilis for all pregnant women is being implemented, more than 23,000 syphilis-related adverse pregnancy outcomes are estimated to occur annually in Ethiopia (26, 27).



The prevalence of syphilis based on the geographical regions of Ethiopia was 4.06% (95% CI, 2.86–5.26) in SNNP, 2.16% (95% CI, 1.57–2.75) in Amhara, and 1.46% (95% CI, 0.69–2.23) in Oromia region (26).

According to a study conducted at Jimma University Specialized Hospital; (1.1%) women were seropositive for syphilis (28). Other studies conducted at Felege Hiwot Referral Hospital, Bahir Dar; (2.6%) were found to be seropositive for *Treponema pallidum* (29), and in Jinka town public health facilities the sero-prevalence of syphilis among pregnant women attending antenatal care clinics was 4.8% (30).

## **2.2 Factors associated with syphilis in pregnancy**

According to studies conducted on different settings showed that variations in socio-demographic characteristics, having multiple sexual partners, lack of access to treatment of sexually transmitted diseases (STDs including syphilis), a history of miscarriage and stillbirth, comorbidities such as HIV/AIDS and cultural practices are amongst the risk factors associated with syphilis infection (23, 29).

### **2.2.1 Socio-demographic factors associated with syphilis in pregnancy**

Maternal age, residence, educational level, educational level of husband, occupational status, occupational status of the husband, number of pregnancies, history of abortion, history of STI, and HIV/AIDS status have been some of the factors studied and reported in different epidemiologic studies as they affect the magnitude of syphilis serostatus. However, there are important contributing factors like alcohol use, knowledge about STI, having two or more sexual partners which were given little attention and thus are not well studied and understood (31, 32).

Among the sociodemographic factors, low education level, low income, and marital status (common-law marriage or living together) are identified as risk situations and an expression that syphilis is related to, but not limited to, poverty.

Economic status as measured by monthly income appears to be the most important socio-demographic determinant for syphilis sero-positivity among pregnant women attending antenatal clinic. Low socio-economic factor initiates multiple sexual partnership, unprotected sex and predisposes to STI (7).

### **2.2.2 Behavioral related factors associated with syphilis in pregnancy**

Equally important are the behaviors that make women vulnerable, that is being associated with a higher risk, such as lower age of first sexual intercourse and pregnancy, high number of sexual partners, non-adherence to safe sex practices, use of illicit and psychoactive drugs, among others. Some of these conditions increase the risk when related to the insufficient access to health services (22, 33).

According to a CDC study conducted in Arizona and Georgia; pregnant patients with syphilis who used substances had a greater chance of passing the infection along to their baby compared with those without substance use. From 2018 to 2021, patients who had a congenital syphilis pregnancy outcome -- defined as a syphilitic stillbirth or a live birth with a syphilis diagnosis -- had almost double the rate of substance use compared with those without this outcome (48.1% vs 24.6%; prevalence ratio [PR] 1.95, 95% CI 1.60-2.38) (34).

According to EDHS 2016, less than 1 percent of women reported that they had two or more partners in the past 12 months. The mean number of lifetime partners among all women who have ever had sexual intercourse is 1.6. Three percent of men age 15-49 reported that they had two or more partners in the past 12 months. The mean number of lifetime partners among all men who have ever had sexual intercourse is 2.9 (35). According to a systematic review and meta-analysis study conducted in Ethiopia, pregnant women with previous history of multiple sexual partners were 2.98 times more likely to get syphilis infection compared to women without such partner. On the other hand, this meta-analysis study also demonstrated that married women had 63% lower risk of developing syphilis compared to those who are not cohabiting (single, widowed, divorced) (26).

### 2.3 Conceptual framework

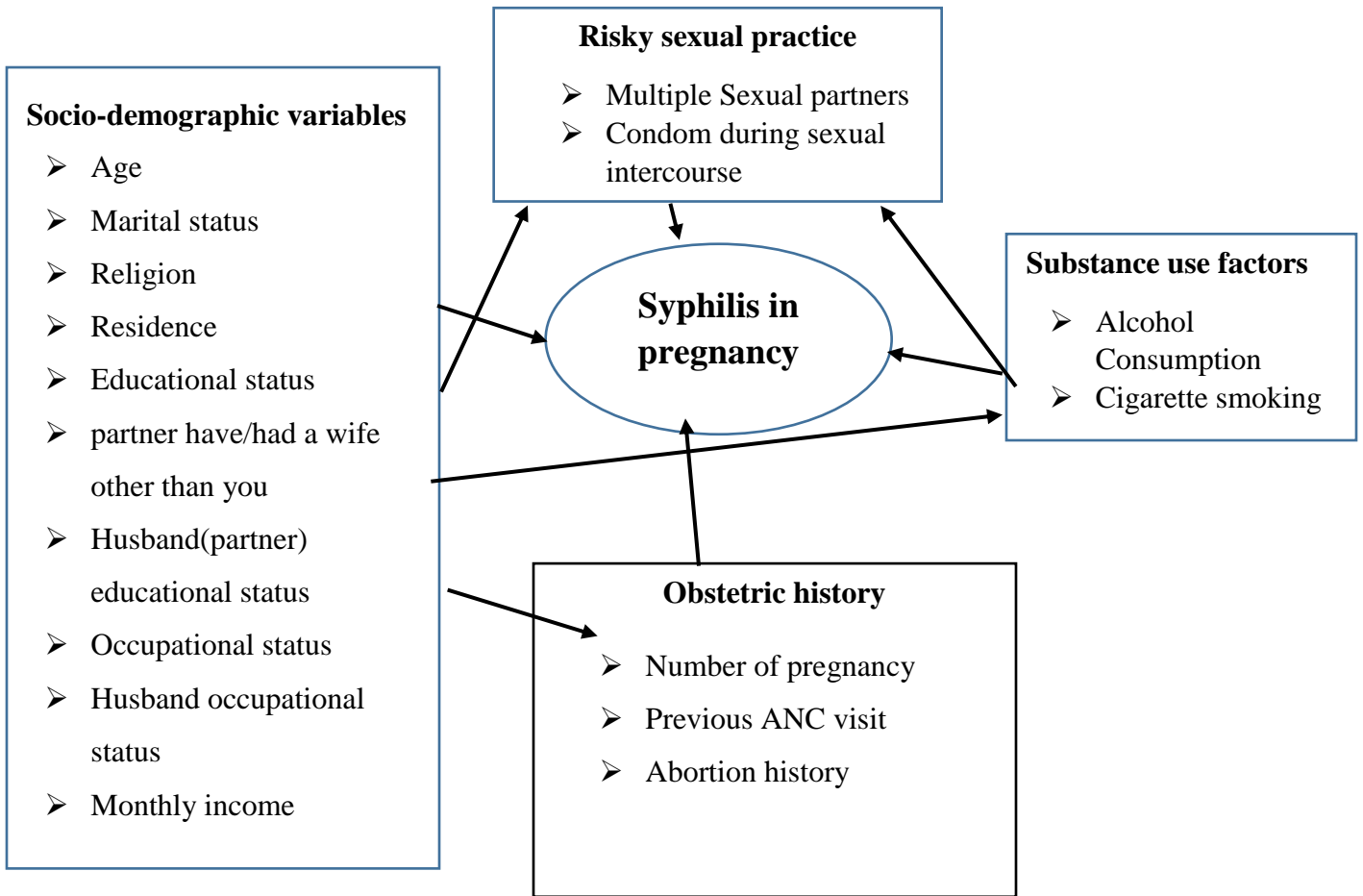


Figure 1: Conceptual framework of the study adapted from different literatures (31, 32).

### 3. OBJECTIVES

#### 3.1 General Objective

- To assess the magnitude of syphilis and its associated factors among pregnant women attending antenatal care clinic at Debre Berhan Town Public Health Institutions, North Shewa Zone, Amhara National Regional State, Ethiopia, 2022.

#### 3.2 Specific objectives

- To determine the magnitude of syphilis among pregnant women attending antenatal care clinic at Debre Berhan Town Public Health Institutions, 2022.
- To identify associated factors for syphilis among pregnant women attending antenatal care clinic at Debre Berhan Town Public Health Institutions, 2022.

## 4. METHODS AND MATERIALS

### 4.1 Study area and period

Debre Berhan is located 130 Km northeast away from Addis Ababa, the capital city of Ethiopia. The town has 2 referral hospital, 1 private hospital, 3 health centers, 5 health posts and 18 private clinics. This study was conducted at Debre Berhan Town Public Health Institutions from June 20, 2022- July 20, 2022.

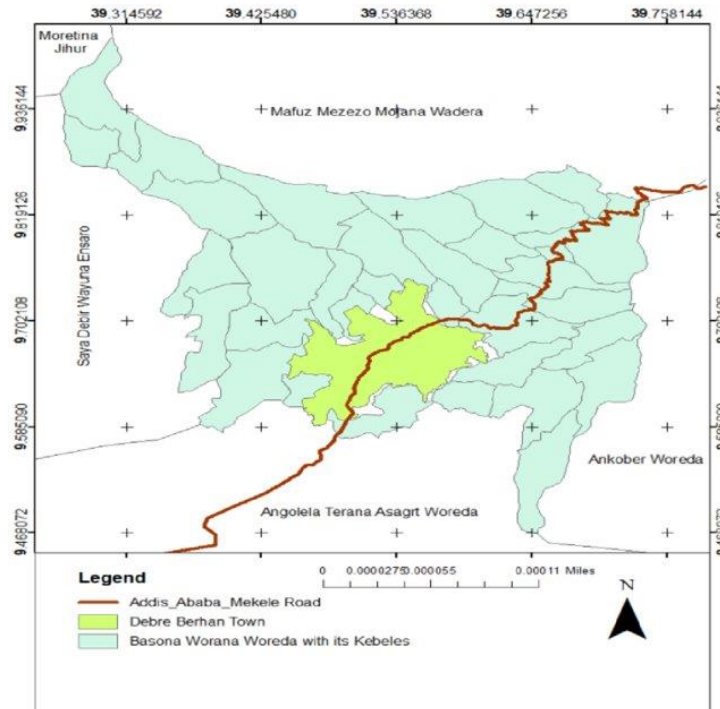


Figure-2: Map of Debre Berhan Town, North Shewa Zone, Amhara, 2022.

### 4.2 Study design

A facility based cross sectional study was carried out among pregnant women attending antenatal care clinic in Debre Berhan Town Public Health Institutions, North Shewa Zone.

### 4.3 Source population

All pregnant women who were attending antenatal care clinic in Debre Berhan Town Public Health Institutions.

### 4.4 Study population

All pregnant women who were attending antenatal care clinic in Debre Berhan Town Public Health Institutions at the time of the study.

#### 4.5 Study unit

The study subject for this study were those pregnant women who were enrolled in the public health services of Debre-Berhan time at the time of the study.

#### 4.6 Sample size determination

Since there was published data on the magnitude of syphilis in Ethiopia. According to this study the prevalence of syphilis among pregnant women in Ethiopia was 2.32% (26). The minimum number of sample size required for this study was determined by using single population proportion formula.

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

d<sup>2</sup>

Where: n<sub>i</sub>= minimum sample size required for the study

Z= Standard normal distribution (Z=1.96), CI of 95% = 0.05

P= Prevalence of syphilis were 2.32%= (0.0232) was used

d= Absolute precision or tolerable margin of error= 3 % (0.03)

$$n_i = \frac{(1.96)^2 \times 0.0232(1-0.0232)}{(0.03)^2} = 96.7$$

(0.03)

**Based on associated factors for syphilis; the final sample size was calculated as follows**

NO	Factors	Prevalence (%)	Total sample size	References
1.	Prevalence of syphilis among pregnant women in Ethiopia	<b>2.32</b>	<b>96.7</b>	(26)
2.	Prevalence among multiple sexual partners	<b>8.8</b>	<b>342</b>	(30)
3.	Prevalence among alcohol users	<b>6.7</b>	<b>267</b>	(30)

Based on this, the final sample size for the factors that has given the maximum sample; so **342** was used

Consider 10% for non-respondents = 34.2      ***The final sample size was = 376.2***

#### 4.7 Sampling Procedure

Debre Berhan town public health institutions were purposively selected since most pregnant women visited these institutions. A total of 4600 pregnant women were registered at the antenatal care clinics at Debre Berhan town public health institutes from October 2022 to June 2022. Lists of pregnant women was prepared using unique identification numbers from medical records found in ANC clinics and sampled by systematic random sampling using the registers sampling frame. The first study participant was selected by a simple random sampling method and the study units were selected until the required sample size was achieved.

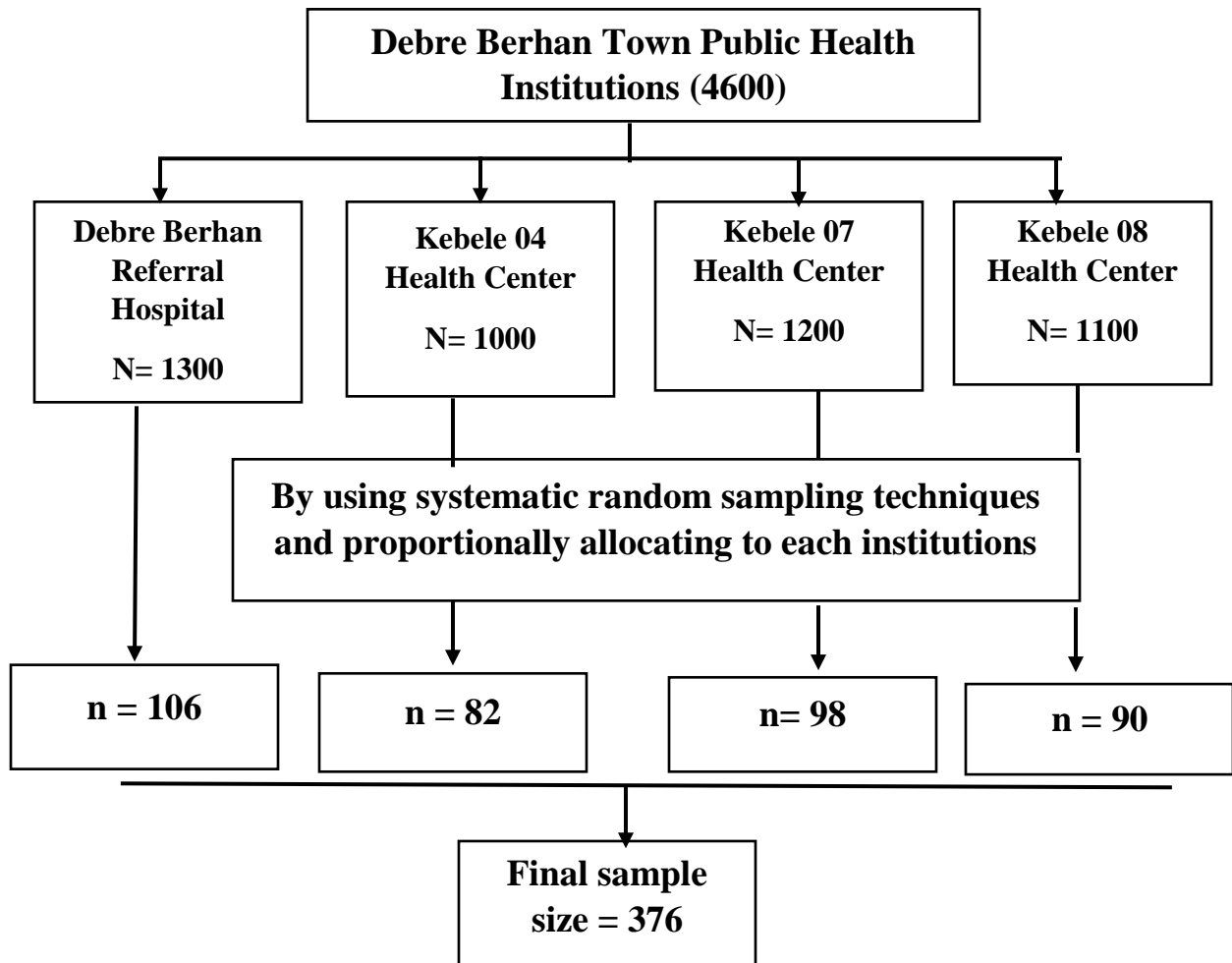


Figure 3: Flow chart indicating sampling procedure in Debre Berhan Town Public Health Institutions, North Shewa Zone, Amhara, 2022.

## **4.8 Inclusion and Exclusion criteria**

### **4.8.1 Inclusion criteria**

- All pregnant women who were registered at the antenatal care clinics of Debre Berhan town public health facilities from October 2022 to June 2022.

### **4.8.2 Exclusion criteria**

- All pregnant women who were seriously ill at the time of data collection
- Those pregnant women who have not given sufficient blood specimen or having error on laboratory result.

## **4.9 Data Collection tool and Procedures**

Data was collected using structured questionnaire adapted from different literatures. Structured questionnaire was used to collect the data from the study participants. Socio-demographic characteristics (age, marital status, occupation, number of pregnancies, monthly income), past obstetric history (parity, gravidity, stillbirth, abortion) and past history of sexually transmitted infections were included in the questionnaire. According to the protocol of antenatal care follow up in the hospital and health centers, serum was examined from the pregnant women for syphilis using VDRL test.

The questionnaire was prepared in English language and translated into Amharic version and then back to English version. Two BSc nurse professionals, and one BSc medical laboratory professional were recruited to collect the data and one Mph health professional was recruited to supervise the data collection process. Timely supervision was under taken by the principal investigator during the data collection period.

## **4.10 Study variables**

### **4.10.1 Dependent variable**

- Magnitude of syphilis

### **4.10.2 Independent variables**

- Socio-demographic characteristics (age, marital status, occupation, number of pregnancies, monthly income)
- Past obstetric history (parity, gravidity, stillbirth, abortion) and
- Past history of sexually transmitted infections



- History of multiple sexual partners

#### **4.11 Data analysis and Interpretation**

Each filled questionnaire was checked for completeness and consistency. The data was entered into EPI data manager version 3.3 and analyzed using IBM SPSS Statistics version 22. A summary descriptive statistic was computed for most variables. Bivariable analysis was done to determine the presence of association. To avoid unstable estimates in the subsequent model, only variables that reached a p-value less than 0.2 at bivariate analysis were kept in the subsequent model analysis. Multiple logistic regression analysis was applied to describe the functional independent factors. A point estimates of Odds ratio (OR) with 95% confidence interval (CI) was determined to assess the strength of association between independent and dependent variables. For all statistically significant tests p- value<0.05 was used as a cut-off point.

#### **4.12 Data quality control**

To maintain data quality, training has given for data collectors and for supervisor for 3 days. Properly designed data collection materials were developed. Supervision was carried out on daily bases to check completeness, consistency by both the supervisors and the principal investigator to keep the quality of data. Pretest was performed in 5% of participants to the actual data collection time and correction was carried out.

#### **4.13 Ethical consideration**

Ethical clearance was obtained from IRB of Debre Berhan University, Department of public health. Data collection was started after permission letters were obtained from the study health facilities. Oral or written informed consent was used and any possible risk on the participants was minimized. Presence or absence of any benefits of the study for the participants was also be described. Data collected from the participants were kept in a secured cabinet in order to maintain confidentiality. Voluntary participation was ensured, and participants were free to opt out.

#### **4.14 Operational Definition**

*Case Definition of Syphilis.* In this study, a case of syphilis was considered when Rapid Plasma Reagin (RPR) or Venereal Disease Research Laboratory (VDRL) test was reactive for syphilis infection among pregnant women (23).

*Alcohol use.* Consuming alcohol at least once per month in the last twelve months (above the r

## 5. RESULTS

### 5.1 Socio-demographic characteristics of pregnant women included in the study

A total of 362 study participants were successfully involved in the study yielding a response rate of 96.3%. The majority 331 (91.4%), 310 (85.6%), and 279 (77.1%) of study participants were married, Orthodox Christians, and urbanities respectively. Their ages ranged from 19 to 49 years with a mean age of  $28.41 \pm 5.37$  years. The average monthly household income was 5129 ETB (Table-1).

Table 1: Socio-demographic characteristics of study participants, Debre Berhan Town Public Health Institutions, North Shewa Zone, Amhara, Ethiopia, 2022.

Socio-demographic Variables	Frequency (%)	
Age group	<20	29 (8%)
	25-29	65 (18%)
	30-34	96 (26.5%)
	35-39	36 (9.9%)
	40-44	6 (1.7%)
	45-49	4 (1.1%)
Marital status	Married	328 (90.6%)
	Unmarried	34 (9.3%)
Religion	Orthodox	310 (85.6%)
	Muslim	40 (11%)
	Protestant	12 (3.3%)
Residence	Urban	279 (77.1%)
	Rural	83 (22.9%)
Educational status	Unable to read and write	25 (6.9%)
	Read and write	35 (9.7%)
	Primary school	80 (22.1%)
	Secondary school	125 (34.5%)
	College and above	97 (26.8%)
Husband educational status	Unable to read and write	20 (5.5%)
	Read and write	20 (5.5%)
	Primary school	49 (13.5%)
	Secondary school	117 (32.3%)
	College and above	125 (34.5%)
Occupational status	Merchant	31 (8.6%)
	Government employee	98 (27.1%)
	Private employee	88 (24.3%)
	Farmer	30 (8.3%)
	Student	5 (1.4%)
	House wives	110 (30.4%)
Husband occupational status	Merchant	31 (8.6%)
	Government employee	98 (27.1%)
	Private employee	139 (38.4%)

Farmer	36 (9.9%)
Student	10 (2.8%)
Others	17 (4.7%)

## 5.2 Medical and obstetric history of participants

Two hundred thirty-six (65.2%), and 325 (89.8%) of the study participants were tested for diabetes mellitus, and HIV respectively. Among the study participant, 15 (4.1%) had previous history of STI (Figure 2). Regarding the obstetric history, 231 (63.8%) of the study participants were multigravida and 110 (30.4%) had only one child. Two hundred seven (57.2%) had previous history of ANC visits. Concerning current ANC visit, 142 (39.2%) of pregnant mothers were on their second ANC visits and 41 (11.3%) were on their fourth ANC visit. Only 25 (6.9%) of the mothers experiencing abortion. Most of the abortions 20 (5.5%) were spontaneous type.

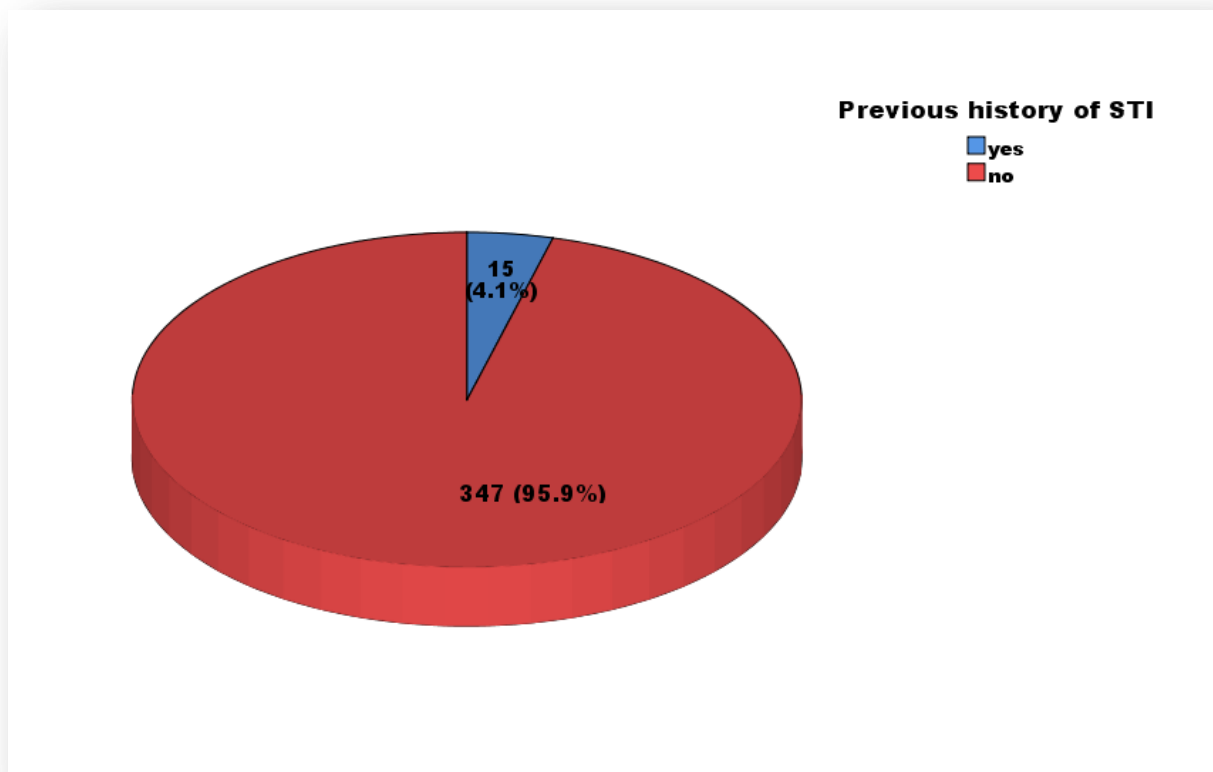


Figure 4: Previous history of STI among study participants in Debre Berhan Town Public Health Institutions, 2022.

### 5.3 Knowledge of study participants about syphilis

Majority of the study participants, 315 (87%) had knowledge about STI. Among the study participants who ever heard of STI, 199 (55%) of them had heard STI related information from health institutions. Three fourth 284 (78.5%) of the study participants were correctly answered the route of transmission of STI. About 276 (76.2%) of the study participants do not know that syphilis can be transmitted during blood transfusion, whereas 279 (77.1%) of the study participants do not know about transcendent transmission of syphilis. About 113 (31.2%), 83 (22.9%), 274 (75.7%), 304 (87%), 9 (2.5%), and 264 (72.9%), do not know the listed STI diseases; gonorrhoea, syphilis, genital herpes, trichomonas, HIV, and Chlamydia respectively. Approximately half, 176 (55.9%) of the study participants know the symptoms of STI. The majority of the study participants 300 (95.2%) know that syphilis is preventable and curable. Only, 35 (11.1%) of the study participants do not know that syphilis could increase the risk of HIV transmission (Table 2).

Table 2: Knowledge of the study participants about syphilis in Debre Berhan Town, North Shewa Zone, Amhara, Ethiopia, 2022.

Knowledge questions	Frequency (%)	
	Yes	No
Heard about STI	315 (87%)	47 (13%)
Syphilis is mainly transmitted through sexual contact	284 (90.2%)	31 (9.8%)
Knows the symptoms of Syphilis	176 (55.9%)	139 (44.1%)
Knows that syphilis is preventable and curable	300 (95.2%)	15 (4.8%)
Using condoms consistently in sexual contact can prevent the transmission of syphilis	280 (88.9%)	35 (11.1%)
Knows how to prevent mother to child transmission of Syphilis	274 (87%)	41 (13%)
Syphilis infection can increase the risk of HIV transmission	280 (88.9%)	35 (11.1%)

#### **5.4 Behavior characteristics of study participants**

Among the study participants, majority 273 (75.4%) of them had ever drunk alcohol. All of them used alcohol in the last twelve months. Out of the study participants, 347 (95.9%) never used substances or drugs of abused. Only, 10 (2.8%) had multiple sexual partners (Table-3).

Table 3: Behavior characteristics of study participants in Debre Berhan Town, North Shewa Zone, Amhara, Ethiopia, 2022.

<b>Behavior characteristics</b>	<b>Frequency (%)</b>
Ever drunk alcohol	273 (75.4%)
Alcohol used in the last twelve months	362 (100%)
Drunk alcohol occasionally (once per month)	216 (79.1%)
Never used substances or drugs of abused	347 (95.9%)
Had multiple sexual partners	10 (2.8%)
Condom use during sexual intercourse	0

#### **5.5 Magnitude of syphilis among pregnant women**

Out of 362, study participants, 8 (2.2%) pregnant women were found to be reactive to syphilis by VDRL test. Furthermore, 8 (2.2%) were also found to be reactive for HIV/AIDS. Syphilis prevalence of 2.5% were found among pregnant women who reside in urban area. A high prevalence of syphilis (16%) were observed among pregnant women who were unable to read and write. Relatively high seroprevalence of syphilis (5.6%) were observed among pregnant women of age group 25-29 years old.

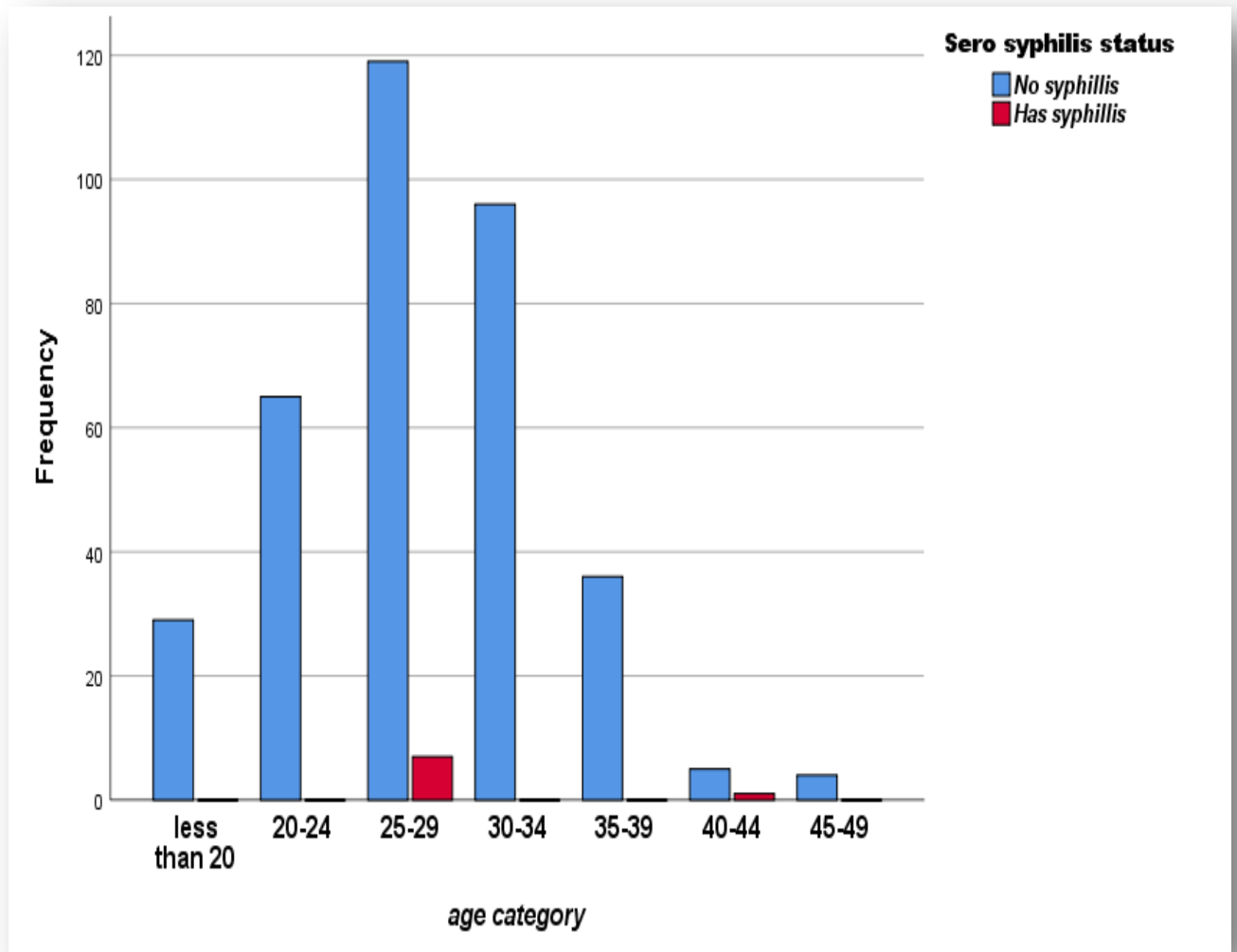


Figure 5: Sero syphilis status by age group among study participants in Debre Berhan Town Public Health Institutions, 2022.

The magnitude of syphilis-HIV co-infection among pregnant women were 2 (0.55%) (Figure 4).

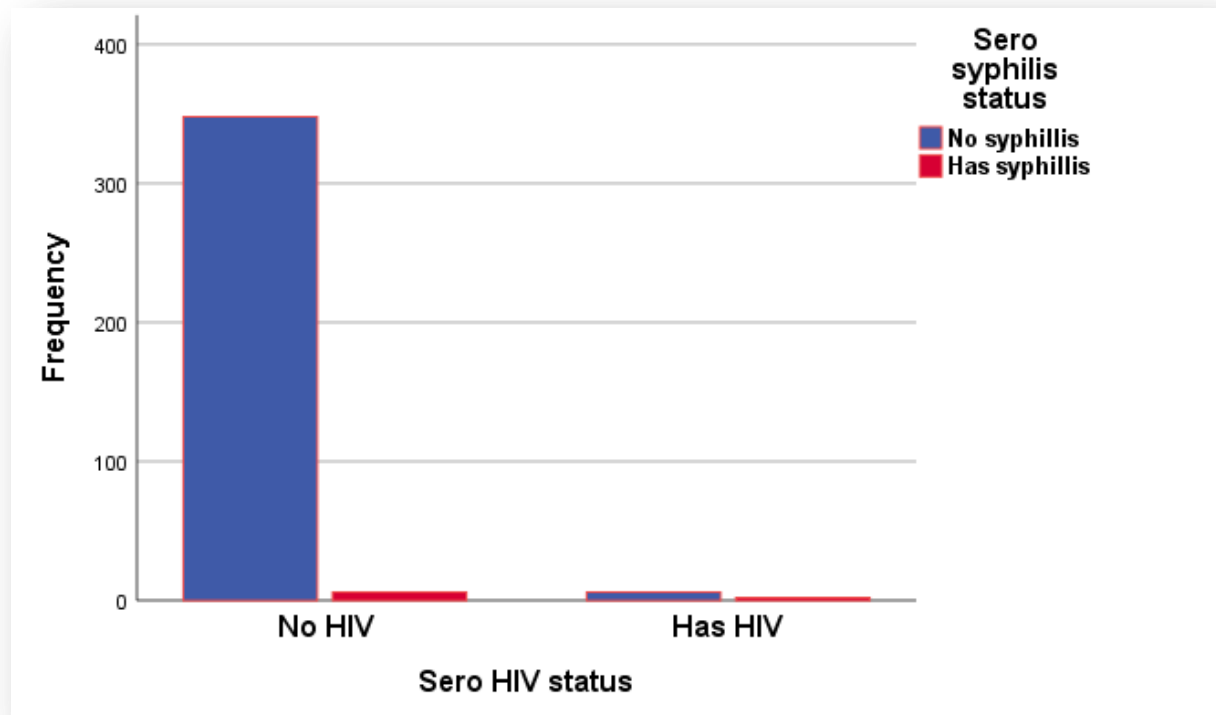


Figure 6: Syphilis-HIV co-infection among study participants in Debre Berhan Town Public Health Institutions, 2022

### 5.6 Factors associated with syphilis among study participants

All independent variables were entered into bivariable logistic regression. Marital status, educational status, previous ANC visits, substance use, previous history of STI, knowledge about STI, and reactive to HIV/AIDS test were crudely associated with syphilis seroprevalence. All variables with p-value  $\leq 0.25$  were entered into the multivariable logistic regression model.

During the multivariable logistic regression analysis, study participants who had no formal education were 25.54 times more likely to get infected with syphilis than those who had formal education (AOR=25.54, 95% CI: 1.63- 77.50). Regarding the knowledge about syphilis, study participants who had poor knowledge about syphilis were 2.32 times more likely to acquire syphilis than those with good knowledge of syphilis (AOR=2.32, 95%CI: 1.27-12.42). Study participants who had previous history of STI were 13.24 times more likely to get syphilis than those who had no previous history of STI (AOR=13.24, 95%CI: 1.95- 33.24). Study participants who were reactive for HIV/AIDS test were 8.03 times more likely to acquire syphilis than those who were negative for HIV/AIDS test (AOR=8.03, 95%CI:1.75-15.97). Study participants who

had poor knowledge on STI were 8.03 times more likely to acquire the disease (AOR=2.32, 95% CI: (1.27-12.42).

Table 4: Multivariable logistic regression model for association of maternal syphilis in study participants visiting ANC at Debre Berhan Town Public Health Institutions, North Shewa Zone,

<b>Variables</b>		<b>Syphilis</b>	<b>Syphilis</b>	<b>COR (95% CI)</b>	<b>AOR (95% CI)</b>
		<b>Yes, n (%)</b>	<b>No (%)</b>		
<b>Marital status</b>	Currently married	3(0.9%)	325 (99.1%)	1	1
	Currently unmarried	5 (14.7%)	29 (85.3%)	18.67 (4.24-82.12)	16.1(0.35-73.1)
<b>Educational status</b>	No formal education	4 (1.2%)	333 (98.8%)	15.85(3.70-67.89)	25.54(1.63- 77.5)
	Formal education	4 (1.2%)	21 (84%)	1	1
<b>Previous ANC visits</b>	Yes	3(1.4%)	204(98.6%)	1	1
	No	5 (3.2%)	150 (96.8%)	2.26(1.53-9.62)	1.98(0.58-6.15)
<b>Previous history of STI</b>	Yes	2 (13.3%)	13(86.7%)	8.74(1.60-47.54)	13.24(1.95- 33.24)
	No	6 (1.7%)	341 (98.3%)	1	1
<b>Substance use</b>	Yes	3 (20%)	12 (80%)	17.1(3.65-79.9)	4.65(0.87-13.43)
	No	5 (1.4%)	342 (98.6%)	1	1
<b>Knowledge about STI</b>	Yes	5 (1.6%)	310 (98.4%)	1	1
	No	3 (6.4%)	44 (93.6%)	4.22(1.97-18.30)	2.32(1.27-12.42)
<b>Sero HIV</b>	Yes	2 (25%)	6 (75%)	19.33(3.22-116.1)	8.03(1.75-15.97)
	No	6 (1.7%)	348 (98.3%)	1	1

Amhara, Ethiopia, 2022.



## 6. DISCUSSION

In Ethiopia, syphilis continues to be a substantial contributor to reproductive morbidity and poor pregnancy outcomes (36). The seroprevalence of syphilis in this study was (2.2%) which was comparable to the studies conducted in South Gondar (1.9%) (37), Bahir Dar (2.6%) (38), and a systematic review and meta-analysis study conducted among pregnant women in Ethiopia (2.32%) (39). A study done in Tanzania also revealed that 2.5% of pregnant women attending ANC were seropositive for syphilis (25). However, the current finding was slightly higher than studies conducted in Jimma (1.1%) (40), in Buno Bedele (1.4%) (41), and in West Arsi Zone (1.1%) (42). The variation in the findings might be due to differences in geographic sites, sociocultural and economic difference, sample size difference, and access to syphilis diagnosis and treatment.

The current study showed that the prevalence of syphilis-HIV co-infection among pregnant women were (0.55%). This study has showed that pregnant women who were reactive for HIV/AIDS test were 8.03 times more likely to acquire syphilis. A comparable finding were noted in a meta-analysis study conducted in Ethiopia (0.80%) (39), and Republic of Congo (0.73%) (43). This similarity might be partly due to the WHO's increased focus and prioritization of antenatal syphilis (in conjunction with HIV and hepatitis B virus) screening for better intervention measures. Syphilis has an indirect impact through its role in facilitating sexual transmission of human immunodeficiency virus (HIV). Therefore, integrating syphilis-HIV services in health facilities should be beneficial to minimize the burden of these diseases.

This study revealed a high prevalence of syphilis (16%) among pregnant women who were unable to read and write. Study participants who had no formal education were 25.54 times more likely to be infected with syphilis. This finding was supported by the studies conducted in southwest Ethiopia (41), and in Jimma (40). This might be explained by the fact that pregnant women with low educational level might not have adequate knowledge about the transmission and prevention mechanisms of syphilis and where to go for treatment. Therefore, they might predispose to the disease unintentionally. Furthermore, the educational status of the study participants might contribute to poor behavioral factors that are significantly contribute to the diseases.

The current study showed that study participants who had previous history of STI were 13.24 times more likely to get syphilis. Comparable findings were noted in a study conducted in Ethiopia. According to this study, pregnant women who had previous history of STI were more than four times more likely to develop syphilis. This could be partly due to lack of behavioral change and other prevention interventions that resulted in maintaining risky behaviors among women who had history of previous STI. However, it contradicts a study conducted in Buno Bedele Zone (41) that showed that no significant association between previous history of STI and current sero prevalence. This difference might be due to sample size difference.

This study revealed that pregnant women who had poor knowledge on STI were 8.03 times more likely to acquire the disease. This finding was supported by the studies conducted in southwest Ethiopia (41). This might be due to poor knowledge about the transmission and prevention mechanisms of the diseases.

## 7. CONCLUSION

In the current study, most of the study participants had adequate knowledge about STI. This study revealed that small percent of the study participant had multiple sexual partners and had previous history of STI.

The present study showed syphilis was prevalent among the study participants attending ANC in the study area. The study also revealed that prevalence of syphilis-HIV co-infection among pregnant women were low. A high prevalence of syphilis was observed among pregnant women who were unable to read and write.

In multivariable logistic regression model; educational status, previous status of STI, knowledge about STI, and sero HIV status of study participants were significantly associated with seroprevalence of syphilis.

## 8. STRENGTH AND LIMITATION

The main strength of this study was using of primary data by taking blood sample from patients to confirm the sero prevalence of syphilis. Furthermore, the current study investigates syphilis-HIV co-infection.

The main limitation of this study

- The study might also be susceptible to recall bias since some of the information from the study participants were taken retrospectively.
- This study utilized VDRL test, which is a non-treponemal test for confirming syphilis cases. However, the test has its own limitations such as biological false positive and prozone phenomena.

## 9. RECOMMENDATIONS

Based on the findings of this study, the following will be recommended

- Health facilities should educate mothers with syphilis regarding the possibility of future risk of syphilis if no prevention measures are taken.
- Syphilis screening should be conducted on HIV positive patients to prevent complications associated with these diseases.
- Effective health education and promotion activities at facility level should be needed to elucidate the risk factors, transmission, and prevention of syphilis.
- The study facilities should undertake routine screening of all ANC women and integration of syphilis testing and treatment to the already established HIV prevention program in the country.
- Future treponemal test should be conducted to detect the actual burden of syphilis
- National, multicenter, prospective and community-based study should be conducted to assess the real burden of the disease.

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## 11. ANNEX

### 11.1 Annex-I: Questionnaire

#### 11.1.1 English Version Consent form

##### Part-I Subject Information Sheet

**Principal investigator: Kalkidan Engidashet**

**Organization: Asrat Woldeyes Health Science Campus**

My name is Kalkidan Engidashet student of Asrat Woldeyes Health Science Campus Department of public health. I am doing a research on “Prevalence of Syphilis and Its associated Factors among Pregnant Women Attending Antenatal Care Clinic at Debre Berhan Referral Hospital, North Shewa Zone, Amhara National Regional State, Ethiopia.” I received permission letter from Asrat Woldeyes Health Science Campus and Public health Institutions.

You are selected by systematic random sampling method to participate in this study because you are currently attending ANC follow up. Your participation is purely based on your willingness. You have the right to choose not to take part in this study. If you choose to take part, you have the right to stop at any time. If you are willing to participate or refuse or decide to withdraw later, you will not be subjected to any ill-treatment.

If you agree to participate in the study, you will be asked to answer some questions about yourself, your life-style and dietary pattern practice. The interview with you will take about 30 minutes.

The study will investigate Prevalence of Syphilis and Its associated Factors among Pregnant Women Attending Antenatal Care Clinic at Debre Berhan Referral Hospital, North Shewa Zone, Amhara National Regional State, Ethiopia. It can also provide base line data for policy makers and other researchers for further improvements. The information that you provide will be kept confidential by using only code numbers. Do not give your name. No one will have access to the non-coded data except the principal investigator and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

**Address:** Kalkidan Engidashet

**Phone number:** 0910991293

**Email Address:** kalkidanengdashet1219@gmail.com

**Part-II: Informed Consent Form**

Based on the understanding of the information and I have given information, are you willing to participate in this study?

A) Yes

B) No

(1) If yes, I will continue

2) If no I will skip to next participant after writing the reasons of refusal.

**Respondent**

Signature \_\_\_\_\_ Date \_\_\_\_\_

**Interviewer**

Name \_\_\_\_\_ Signature \_\_\_\_\_

Questionnaires number \_\_\_\_\_

Date of interview \_\_\_\_\_ Starting time \_\_\_\_\_ Completed \_\_\_\_\_

Result of interview A) Completed

B) Not completed

C) Partially completed

D) Refused

Checked by Supervisor: Name \_\_\_\_\_ Signature \_\_\_\_\_

Address: Kalkidan Engidashet

### 11.1.2 English Version Questionnaire

Questionnaire ID \_\_\_\_\_

Date \_\_\_\_\_

Name of

Facility\_\_\_\_\_

<b>Part I: SOCIO - DEMOGRAPHIC DATA</b>		
S NO	Questions	Response
1.	Age	_____years
2.	What is your marital status?	1. Married 2. Living together 3. Divorced/Separated 4. Widowed 5. Single
3.	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Other( specify)_____
4.	Residence	1. Urban 2. Rural
5.	Do your partner have/had a wife other than you?	1.yes 2. no
6	What is your educational status?	1. unable to read and write 2. Read and write 3. Primary 4. Secondary(9-12) 5. college and above

7	Husband(partner) educational status	<ol style="list-style-type: none"> <li>1. unable to read and write</li> <li>2. Read and write</li> <li>3. Primary</li> <li>4. Secondary(9-12)</li> <li>5. college and above</li> </ol>
8	What is your occupational status?	<ol style="list-style-type: none"> <li>1. Merchant</li> <li>2. Government employee</li> <li>3. Private employee</li> <li>4. Farmer</li> <li>5. Student</li> <li>6. Daily laborer</li> <li>7. Other (specify)</li> </ol>
9	What is occupation of your husband?	<ol style="list-style-type: none"> <li>1. Merchant</li> <li>2. Government employee</li> <li>3. Private employee</li> <li>4. Farmer</li> <li>5. Student</li> <li>6. Daily laborer</li> <li>7. Other (specify)</li> </ol>
10	Monthly income of the family (ETB)?	_____
S No	<b>Part II: Obstetric history</b>	
1.	How many pregnancies you experienced including the	_____in number

	current pregnancy?	
2.	Do you have a history of ANC visit in the previous pregnancy (for multigravida women)	1.yes 2. no
3.	Gestational period at the time of screening for syphilis	_____in month/week
4.	Number of ANC visits for the current Pregnancy?	_____number
5.	Number of children born alive?	_____
6.	Do you have an experience of abortion?	1.yes 2. no
7.	If question number 6 is yes, how many times?	_____
8.	If question number 6 is yes, type of abortion occurred?	1. spontaneous 2. induced
S No.	<b>Part III: Medical history</b>	
1.	Have you ever been diagnosed with	1. diabetic Mellitus 2. HIV/AIDS 3. No
2	Have you ever been diagnosed with an STI?	1. Yes 2. No
3	If ques number 2 is yes, When?	_____
4.	If ques no. 2 yes, How were you treated?	1. No treatment 2. Treated with injection 3. Treated with oral medication

		4. Herbal medicine
S NO	<b>Part IV: Laboratory results (document review)</b>	
1.	Rapid syphilis test result	1. Reactive 2. Non-reactive
2.	HIV test result	1. Reactive 2. Non-reactive
S No	<b>Part V: knowledge related factor</b>	
1.	Have you ever heard of STIs?	1. Yes 2. No
2.	If ques no. is yes source of information	1. Health institution 2. School 3. Television 4. Radio 5. peers/relative/ neighbor 6. Other (specify) _____
3.	What are the routes of transmission of STIs	1. unprotected sexual intercourse 2. infected mother to fetus through trans placental 3. during blood transfusion( donation) 4. sharing injection needles 5. others (specify)

4.	Do the following disease are sexually transmitted?	<ol style="list-style-type: none"> <li>1. Gonorrhoea</li> <li>2. Syphilis</li> <li>3. Genital herpes</li> <li>4. Trichomonas's</li> <li>5. HIV/AIDS</li> <li>6. Chlamydia</li> <li>7. Hepatitis B and C</li> </ol>
5.	What are the symptoms of STI?	<ol style="list-style-type: none"> <li>1. Ulcer on the genital area</li> <li>2. Vaginal discharge</li> <li>3. pain during sex or when urinating</li> <li>4. painless red sores</li> <li>5. Swollen glands</li> <li>6. Others (specify)</li> </ol>
6.	Can STIs be prevented?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
7.	Do condoms prevent STIs?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
8.	Is it possible to prevent mother to child transmission of STI by attending ANC clinic for diagnosis and taking the appropriate medication during pregnancy	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
9.	If a person has HIV/AIDS, does he/she have a greater chance of syphilis infection?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
S No	<b>Part VI: Behavior related factor</b>	
1.	Have you ever used alcoholic drinks?	1. Yes

	(Cheka, Tela, Katikala, Beer, Wine supermint etc.)	2. No
2.	Have you drink alcohol in the last 12 months	1. Yes 2.No
3.	If ques. No. 2 is yes, how many times per month have you drank	1.Sometimes (once per month) 2.Two to four times per month 3.five or more than five times per month
4.	Have you ever used drugs of abuse? (like Khat, shisha, cannabis, cocaine, tobacco)	1.Never 2.Some times 3.Two to four times per month 4.five or more than five times per month
5.	Number of sexual partners ever you have	_____
6.	In the past 12 months, how many sexual partners have you had?	_____
7.	If ques no.6 answer is two or more, did you use a condom during sexual intercourse?	1. Yes 2. No
8.	If ques no.7 no, the reason for not using	1. Partner objection 2. Dislike using a condom 3. Ashamed to ask my partner 4. Faithful to my partner 5. Religious prohibition 6. Other (specify)_____



ተ.ቁ	ክፍል አንድ ጥያቄዎች	መልስ
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**11.1.2 Amharic version questionnaire**

**11.1.2.1 የ ስምምነት ፈቃድ**

በመረጃዎ ግንዛቤ ላይ በመመስርት መረጃ ሰጥቻለሁ ፤ በዚህ ጥናት ውስጥ ለመሳተፍ ፍቃደኛ ኖት

ሀ አዎ

ለ አይ

1 አዎ ከሆነ ጸቅጥላለሁ

2 አዎ ካልሆነ ወደሌላ ጥያቄ ጸቅጥላለሁ

ተጠያቂ

ፊርማ \_\_\_ ቀን \_\_\_\_\_

ጠያቂ

ስም \_\_\_\_\_ ፊርማ \_\_\_\_\_

የመጠየቅ ቁ.ጥ \_\_\_\_\_

የተጠየቁበት ቀን \_\_\_\_\_ የጀመሩበት ሰዓት \_\_\_\_\_ ያለቀበት

ጠጥያቄ ወጤት

ሀ/ ተጠናቀቀ

ለ/አልተጠናቀቀም

ሐ/በከፊል ተጠቋል

መ/ ተቋርቷል

በተቆጣጣሪ የተረጋገጠ ስም \_\_\_\_\_ ፊርማ \_\_\_\_\_

1.	እድሜ	-----
2.	የጋብቻ ሁኔታ	<ol style="list-style-type: none"> <li>1. ያገባ</li> <li>2. አብሮ የሚኖር</li> <li>3. የተፋታ</li> <li>4. ባል የሞተባት</li> <li>5. ላቤ</li> </ol>
3.	ሀይማኖት	<ol style="list-style-type: none"> <li>1. ኦርቶዶክስ</li> <li>2. ሙስሊም</li> <li>3. ፕሮቴስታንት</li> <li>4. ሌላ----</li> </ol>
4.	የመኖሪያ ቦታ	<ol style="list-style-type: none"> <li>1. ከተማ</li> <li>2. ገጠር</li> </ol>
5.	የትዳር ጓደኛዎ ከእርሶዎ ሌላ ሚስት ነበረው?	<ol style="list-style-type: none"> <li>1. አዎ</li> <li>2. የለውም</li> </ol>
6.	የትምህርት ደረጃ	<ol style="list-style-type: none"> <li>1. ማንበብና መጻፍ የማትችል</li> <li>2. ማንበብና መጻፍ የሚችል</li> <li>3. የመጀመሪያ ደረጃ(1-8)</li> <li>4. ሁለተኛ ደረጃ(9-12)</li> <li>5. ከኮሌጅ እና ከዚያ በላይ</li> </ol>
7.	የባል(የትዳር አጋር የትምህርት ሁኔታ	<ol style="list-style-type: none"> <li>1. ማንበብና መጻፍ የማይችል</li> <li>2. ማንበብና መጻፍ የሚችል</li> <li>3. የመጀመሪያ ደረጃ(1-8)</li> <li>4. ሁለተኛ ደረጃ(9-12)</li> <li>5. ከኮሌጅ እና ከዚያ በላይ</li> </ol>
8.	የስራ ሁኔታ	<ol style="list-style-type: none"> <li>1. ነጋዴ</li> <li>2. የመንግስት ሰራተኛ</li> <li>3. የግል</li> <li>4. ገበሬ</li> <li>5. ተማሪ</li> <li>6. የቀን ሰራተኛ</li> <li>7. ሌላ--</li> </ol>
9.	የባል(የትዳር አጋር) የስራ ሁኔታ	<ol style="list-style-type: none"> <li>1. ነጋዴ</li> <li>2. የመንግስት ሰራተኛ</li> <li>3. የግል</li> <li>4. ገበሬ</li> <li>5. ተማሪ</li> <li>6. የቀን ሰራተኛ</li> <li>7. ሌላ--</li> </ol>

10.	የቤተሰብ ወረሃዊ ገቢ(በኢትዮጵያ ብር)	-----
<b>ተ.ቁ</b>	<b>ክፍል ሁለት ጥያቄዎች</b>	
1.	ያሁኑ እርግዝና ለስንተኛ ጊዜ ነው?	----
2.	ከዚህ በፊት የነበረው እርግዝና ክትትል ነበረሽ?	1. አዎ 2. አልነበረኝም
3.	የአባላዘር ምርመራ በሚያደርጉበት ጊዜ እርግዝናዎት ስንት ጊዜው ነው?	1. - ወር 2. - ሳምንት
4.	ስንተኛ ጊዜዎት ነው ANC ስትመጧ?	- -
5.	በህይወት የተወለዱ የልጆች ቁጥር?	- -
6.	ከዚህ በፊት ፅንሰ አቋርጠው ያውቃሉ?	1. አዎ 2. አላውቅም
7.	ጥያቄ ቁጥር 6 አዎ ከሆነ ስንት ጊዜ?	- -
8.	ጥያቄ ቁጥር 6 አዎ ከሆነ ምን አይነት ፅንሰ መቋረጥ ?	1. በድንገት 2. በአንቺ ፍላጎት
<b>ተ.ቁ</b>	<b>ክፍል ሶስት ጥያቄዎች የህክምና ታሪክ</b>	
1.	የህክምና ታሪክ?	1. ስኳር 2. ኤች አይቪ ኤድስ 3. የለም
2	የአባላዘር በሽታ ተመርምረው እንዳለብዎት አውቀዋል ?	1. አዎ 2. አላውቅም

3.	ጥያቄ ቁጥር 2 አዎ ከሆነ,መቼ?	-----
4	ጥያቄ ቁጥር 2 አዎ ከሆነ ህክምናውን እንዴት ታከምሽ?	<ol style="list-style-type: none"> <li>1. አልታከምኩም</li> <li>2. በመርፌ ታክማለሁ</li> <li>3. በኪኒን ታክማለሁ</li> <li>4. በባህል መዳኒት ታክማለሁ</li> </ol>
ተ.ቁ.	ክፍል አራት ላብራቶሪ ውጤቶች( መዝገብ)	
1.	ፈጣን የቁጥኝ ምርመራ ውጤቶች ?	<ol style="list-style-type: none"> <li>1. አለ</li> <li>2. የለም</li> </ol>
2.	የኤች እቪ. ምርመራ ውጤት?	<ol style="list-style-type: none"> <li>1. አለ</li> <li>2. የለም</li> </ol>
ተ.ቁ.	ክፍል አምስት ከእውቀት ጋር የተያያዘ ምክንያት	
1.	ስለ አባላዘር በሽታ ሰምተው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. አዎ</li> <li>2. አላውቅም</li> </ol>
2.	ጥያቄ ቁጥር አዎ ከሆነ ,ከየት ሰማው?	<ol style="list-style-type: none"> <li>1. ከጤና ተቋም</li> <li>2. ከት.ቤት</li> <li>3. ከቴሌቪዥን</li> <li>4. ራድዮ</li> <li>5. ከእድሜ እኩያ- ጎረቤት፣ ዘመድ</li> <li>6. ከሌላ-</li> </ol>
3.	አባላዘር በሽታ መተላለፊያ መንገዶች ምንድናቸው?	<ol style="list-style-type: none"> <li>1. ጥንቃቄ የጎደለው የግብረ ስጋ ግንኙነት</li> <li>2. ከታመመች እናት በእርግዝና ጊዜ ወደ ፅንሱ</li> <li>3. በደም ልገሳ</li> <li>4. ስላታም ነገሮች በጋራ መጠቀም</li> <li>5. ሌላ---</li> </ol>
4.	የሚከተሉት በሽታዎች በግብረ ስጋ ግንኙነት ይተላለፋሉ?	<ol style="list-style-type: none"> <li>1. ጨብጥ</li> <li>2. ቁጥኝ</li> <li>3. የብልት ሽፍታ በሽታ(አልማዝ ባለጭራ)</li> <li>4. የፀጉር ውስጥ ሽፍታ</li> </ol>

		5. ኤች አይቪ ኤድስ 6. የብልት ቁስል 7. የጉበት ቫይረስ ቢ እና ሲ
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5	የአባላዘር በሽታ ምልክቶች ምንድናቸው ?	1 በብልት አካባቢ ላይ ቁስለት 2 የሴት ብልት ፈሳሽ 3 በወሲብ ወይም በሽንት ጊዜ ህመም 4 ህመም የሌላቸው ቀይ ቁስሎች 5 ያበጡ እጢዎች 6 ሌሎች ----
6	የአባላዘር በሽታ መከላከል ይቻላል ?	1 አዎ 2 አይቻልም
7	በኮንዶም መከላከል ይቻላል ?	1 አዎ 2 አይቻልም
8	በእርግዝና ጊዜ በመመርመር እና ተገቢውን መዳሀኒት በመውሰድ ከእናት ወደ ልጅ እንዳይተላለፍ መከላከል ይቻላል ?	1 አዎ 2 አይቻልም
9	አንድ ሰው ኤች አይ ቪ-ኤድስ ካለበት አባላዘር የመያዝ እድሉ ከፍ ያለ ነው ?	1 አዎ 2 አይደለም
ተ-ቁ	ክፍል 6ከባህሪ ጋር የተያያዘ ምክንያት	

1	<p>አልኮል መጠጦች ጠጥተው ያወቃሉ ?</p> <p>(ጠላ ፣ካቲካላ ፣ ቢራ ፣ወይን ፣ሲፐር ሚንት ወዘተ-- )</p>	<p>1 አዎ</p> <p>2 አላወቅም</p>
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2	<p>በዚህ 12 ወር አልኮል ጠጥተው ያወቃሉ?</p>	<p>1 አዎ</p> <p>2 አላወቅም</p>
3	<p>ጥያቄ ቁጥር 2-አ ም ከሆነ ፣በወር ስንት ጊዜ ይጠጣሉ ?</p>	<p>1 አልፎአልፎ --በወር አንዴ</p> <p>2 ከ2-4ጊዜ በወር</p> <p>3 5ጊዜ ወይም ከዚያ በላይ በወር</p>
4	<p>አደገኛ እፅ ተጠቅመው የወቃሉ?</p> <p>(ጫት ፣ሸሻ፣ትንባሆ፣ኮኬይን፣ ካናቢስ )</p>	<p>1 በፍፁም</p> <p>2 አልፎአልፎ</p> <p>3 በወር 2-3 ጊዜ</p> <p>4 5እና ከዚያ በላይ በወር</p>
5	<p>እስካሁን ስንት የወሲብ አጋር አሎት ?</p>	
6	<p>ላለፉት 12 ወራት ውስጥ ስንት ወሲብ አጋር ነበሮት ?</p>	
7	<p>ጥያቄ ቁጥር 6 መልሱ 2 ወይም ከዚያ በላይ ከሆነ ኮንዶም ተጠቅመዋል ?</p>	<p>1 አዎ</p> <p>2 አልተጠቀምኩም</p>
8	<p>ጥያቄ ቁጥር 7 -አልተጠቀምኩም ከሆነ ምክንያት ?</p>	<p>1 የአጋር ተቃዋሚ</p> <p>2 ኮንዶም መጠቀም አለመወደድ</p> <p>3 አገራን መጠየቅ ያስፈራኛል</p> <p>4 ለአጋራ ታማኝ ስለሆንኩ</p> <p>5 ሀይማኖት አይፈቅድም</p> <p>6 ሌላ</p>

